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THE GENERAL SAVINGS AND OLD-AGE PENSION BANK OF BELGIUM.

THE time is not very remote when the idea that the workingman could not only satisfy his immediate wants but make some provision for the future was scarcely entertained. At the present time it is not going too far to say that much of the best efforts now being put forth for the improvement of the welfare of the working classes has this object in view.

The present century, and particularly its last half, has seen the creation and rapid development of provident institutions of all sorts. The movement for workingmen's insurance has swept over Europe, resulting in the enormous extension, either under the auspices of the state or through voluntary efforts of this form of provision for the future. Raiffeisen, Schulze-Delitzch, people's banks, co-operative credit, and kindred institutions, have been organized in great numbers throughout Europe. Savings banks, so organized as to appeal directly to the poorer classes, have progressed with remarkable rapidity.

In this movement the state has felt compelled to play a part. In addition to assuming a more or less strict regulative control

over privately organized institutions, most of the important European nations have supplemented these efforts by themselves creating general savings banks, for the most part organized under, and administered by, their postal departments. Among these the Belgian bank is pre-eminently worthy of attention. As M. de Foville in his report on Savings Banks for the Paris Exposition of 1889 says, this bank is an institution *sui generis*. Its peculiarity and feature of importance consists in the fact that not only is it one of the oldest and most prosperous of state savings banks, but that it has gradually taken to itself other functions until it has become a great central institution ministering to the financial wants of the poorer classes in a great variety of ways. It is thus, at the present time, a general savings bank; it furnishes a system of old-age and invalidity insurance; it is the central agent in granting credit to the farming classes and certain co-operative associations of workingmen; it provides life insurance, and is the institution furnishing the funds for societies which are now doing so much for the provision of improved houses for the working classes. This enumeration shows the important part that it is playing in the movement for social reform in the country. In the study of its multifarious operations there is therefore offered the opportunity of examining in the most direct way the practical efforts now being made in various directions for the improvement of the condition of the laboring classes in Belgium, and the important results that are being accomplished.

The general outline of the history of this institution can be briefly given. Oddly enough the branch relating to the provision of old-age and invalidity pensions was the first to be created. The origin of the bank is found in the law of May 8, 1850, which created a *caisse générale de retraite*. Fifteen years later, by the law of March 16, 1865, a general savings bank was created and joined to it. Since then these two services have constituted separate branches of a single institution under the name of *Caisse générale d'épargne et de retraite*. No further change as regards the field of its operations was made until 1884,

when a law promulgated, April 15 of that year, authorized the bank to employ a part of its funds in loans to farmers or agricultural societies. A new law, enacted June 21, 1894, extended this service by authorizing the loan of money in a somewhat similar way to farmers' co-operative credit societies. Prior to this last act a still further extension of the activities of the bank was decreed by the act of August 9, 1889, which gave to the bank the very important power of loaning money to societies having for their purpose the erection or renting of sanitary and cheap houses for the working classes. Finally by the law of June 21, 1894, the bank was authorized to create a life insurance department.

That we may gain a clear idea of the character of this institution it is desirable to describe separately the work performed by it in each of its various capacities. Fortunately for the investigator, as well as for the efficiency of the management of the bank, the accounts of the different operations are kept rigidly distinct, and it thus becomes an easy matter to study the results achieved by each service.

Savings department.—Though not the first created, the savings department constitutes the central feature of the institution and logically requires first consideration. The savings bank proper, as has been stated, was organized by virtue of the law of March 16, 1865. Though similar in general purpose to the postal savings banks of other European countries, this institution yet possesses features differentiating it radically from these banks. In the first place, though making use of the post offices for its local branches, it cannot, strictly speaking, be called a postal savings bank. It is not placed under the administration of the department of posts and telegraphs, and in fact it was not until four years after its creation, or in 1869, that the use of the post offices as sub-stations was permitted to it. In addition to the use of these offices it also makes use, in a similar way, of the local branches of the national bank and the various registration bureaus. The postal system thus plays no part in the bank other than that use is made of its offices as local branches of the bank.

As far as possible the bank has been given an independent organization. The administration of its affairs is entrusted to a general council composed of twenty-five members appointed by the king. This body has only a general oversight of the operations of the bank. From among its members the king appoints an administrative council of six members and a chief executive or general director in whose hands is placed the actual administration of the bank's business.

The provisions in regard to the making of deposits, the rate of interest allowed, etc., are as follows: According to the law of 1865 single deposits were required to be of at least one franc in amount. In 1881, however, the use of savings slips (*bulletins d'épargne*) were authorized, on which depositors could affix special stamps to the total value of one franc, when they were accepted as deposits of that amount. The special purpose of this device was to encourage saving among the school children. No limit was placed upon the amount of deposits that could be made either at a single time or to the credit of a single account. This is a marked and fundamental departure from the policy pursued by France and other nations in their state savings banks.

The objection to large deposits is that an undue use is thus made of the bank for investment purposes by the wealthier classes; that money in this way is withdrawn from private enterprise which should be in active use through the ordinary banking institutions, and that the security of the bank is endangered in times of crisis by the sudden withdrawal of large sums. To guard against this the usual practice has been to limit the amount that can be deposited at one time or to the credit of the same account. Belgium, it would seem to us, has pursued a much better system in protecting itself against these dangers.

Security against a panic is obtained by the requirement of a notice of six months for the withdrawal of sums of over 3000 francs, of two months for sums from 1000 to 3000 francs, of one month for those from 500 to 1000 francs, and of fifteen days for those from 100 to 500 francs. Sums less than 100 francs can be

withdrawn without prior notice, with the condition, that this privilege cannot be exercised more than once in the same month. It is of course optional with the bank to dispense with this requirement of notice. In the second place the bank can, after due notice, reduce any account to 3000 francs by returning the surplus or investing it for the benefit of the owner in state bonds Finally, and most effective of all, the rate of interest allowed on large deposits is, as will be seen in the next paragraph, lower than that given on small accounts.

The law of 1865 very properly, instead of itself fixing the rate of interest to be paid on deposits, left its determination to the general council with the authority to change the rate from time to time as necessitated by the productiveness of the bank. In practice the rate has been maintained at the uniform figure of 3 per cent. Interest is calculated and added to the principal on December 31st of each year. The 3 per cent. rate at first applied to all accounts no matter what their amount. In 1881, however, the administration, while maintaining the rate on sums of 20,000 francs and less, reduced the rate to 2 per cent. for any surplus over this amount. In 1886 this limit was lowered so that the 2 per cent. rate applied to the surplus over 5000 francs, and in 1894 still further to the surplus over 3000 francs.

In making this distinction between large and small accounts an important exception is made in the case of the deposits of mutual aid and farmers' co-operative credit societies. For these organizations 3 per cent. is allowed on all of their deposits. In case such accounts exceed 20,000 francs, however, the bank has the privilege of converting the excess over this amount into public bonds for the benefit of their owners. This exception in the case of these two classes of societies, it should be observed, works to the mutual advantage of both parties. It is a source of income to the bank as the expenses of administration of large accounts are relatively small, and at the same time the societies have a safe custodian of their funds and realize a very fair rate of interest on such funds as they have to keep on hand to meet current demands.

From the moment of its creation in 1865 the bank has constantly advanced in regard to the extent of its operations. The following table, in which are given the most important figures concerning the number of depositors, the amount of deposits, etc., shows how steady has been this progress and especially its rapidity during recent years:

Year	Number of accounts	Amount on deposit Dec. 31 (francs)	Average value of accounts (francs)
1865	803	529,632	656
1870	52,346	19,620,727	375
1875	106,312	44,857,001	422
1880	200,565	125,098,287	624
1885	444,087	189,061,089	426
1890	731,057	325,415,412	445
1891	800,074	333,428,732	417
1892	869,947	351,308,338	404
1893	960,468	390,181,775	406
1894	1,053,699	427,317,065	406
1895	1,145,408	453,429,304	396
1896	1,238,601	481,160,337	388
1897	1,377,643	532,081,819	386
1898	1,514,810	564,829,271	373

This table, when one takes into consideration the smallness of the population of Belgium, furnishes a really remarkable exhibit of the extent to which economy is practiced by the masses in that kingdom. In 1885 there were 7.5 accounts for every 100 of the population of the country; in 1890, 11.8 accounts; in 1895, 17.9; and in 1898, 22.9, a showing that would almost indicate one account for every family. This proportion, moreover, as can be seen is constantly rising. The number of persons having accounts is increasing at the rate of one hundred thousand or more yearly and the amount of their deposits by from 25 to 50 million francs.

In the face of these figures it is a matter of vital importance to determine the character of the people making use of the bank. The purpose of a state savings bank is to furnish facilities for the saving of small sums which otherwise would in all likelihood be dissipated by their owners. The moment that it goes beyond this and attracts to itself sums of money which would

have been deposited with other financial institutions, or invested in industrial or commercial enterprises, instead of proving a benefit to the country, it is productive of positive evil. In aggregating the small savings it creates capital. In receiving large deposits, while it does not exactly lessen capital, it lessens its energy and effective utilization; and at the same time tends to diminish the very essence of progress, the industrial enterprise of the people.

These considerations have been fully appreciated by the administrators of the Belgian bank and there is every reason to believe that the enormous increase in savings shown by the table represents a true increase in savings on the part of the wage earning classes. The last column shows that the average value of the accounts is steadily diminishing. It will be remembered that in pursuance of the recent action of the managers of the bank but 2 per cent. interest is now paid on deposits in excess of 3000 francs. This has had the effect of decreasing the number of large accounts. In 1894, 2.3 per cent. of the accounts were for sums over this amount as against 1.2 per cent. in 1898. In the latter year, 42.2 per cent. of the accounts had to their credit less than 20 francs, 19.4 per cent. from 20 to 100 francs, 18.7 per cent. from 100 to 500 francs, 6.9 per cent. from 500 to 1000, 6.9 per cent. from 1000 to 2000 francs, and 4.9 per cent. from 2000 to 3000 francs.

As regards the occuptions of depositors, the records of the bank show that there is no doubt that it accomplishes its object of limiting its operations chiefly to the laboring classes. Thus the report for 1898 shows that of 86,136 new accounts opened by adults examined for this purpose 32,847 were made by employees in manufactures, mining, or trade, 13,615 by day and farm laborers, and 8491 by domestics, or a total of 54,953 by the working class proper. Of the remaining 31,183, 15,311 were by housekeepers and persons exercising no profession, the greater number undoubtedly belonging to the class of housekeepers, as 12,854 of this class were females; 6102 by officials and clerks, 965 by teachers, 593 by others exercising a liberal profession, and 817 by proprietors of establishments.

During this year, and not included in the above figures, 124,352 new accounts were opened to the credit of minors. This large number is due to the great extent to which savings by school children has been developed in Belgium. It is a very general practice to give accounts at the savings bank as prizes to the students, and, within recent years, a movement has gained considerable headway for providing, partly at the expense of the commune or city and partly through private philanthropy, every child when born with an account at the bank of one franc with the hope that the parents will continue to make additional deposits for the child's benefit.

In determining the rate of interest to be allowed upon deposits by a state savings bank, the guiding principle should be that the bank should at all hazards be self-supporting. Thanks to the great choice in kinds of investments allowed to the administrators of the bank, the Belgian institution has, during its over thirty years of existence, not only been able to pay all of its operating expenses and 3 per cent. interest on deposits, but has besides accumulated a considerable reserve fund, and since its organization distributed quinquennially a dividend among its depositors. This work has been accomplished absolutely without sacrifice on the part of the state.

This result has been due not only to the skill with which investments have been made, but to the fact that a positive source of profit is found in a number of the operations carried on by the bank. The fact has already been mentioned that the large deposits of mutual aid and farmers' co-operative credit societies give to the bank a considerable sum of money upon which it can earn more than 3 per cent. at but slight cost for administration. The law also provides that such public institutions as hospitals and bureaus of charity, and the provinces, communes, and cities may make use of the bank and its branches for the care of their moneys. That part of these funds which is in the nature of a permanent investment, and therefore not subject to immediate call, earns the regular rate of 3 per cent. The greater part of these deposits, however, consists of the money

which these bodies are obliged to keep on hand to meet current expenses. Upon this but 1½ per cent. interest is paid. The bank has in this way a sum amounting to several million francs upon which it can earn a considerably higher rate of interest than it pays.

The bank is also enabled to make a net profit in several other ways. The payment of only 2 per cent. on the excess of deposits of individuals over 3000 francs leaves a margin for earnings on these sums. All accounts, moreover, concerning which no transaction has been had for thirty years are considered as abandoned and become the property of the bank. As the bank has now been in existence over thirty years it receives more or less in this way every year.

The excellent financial condition of the bank is shown by the following figures taken from the last annual report for the year ending December 31, 1898:[1] The gross earnings during the year were 17,674,914.54 francs. From this sum 15,814,783.51 francs was paid in interest, 1,091,225.95 francs went for operating expenses, and 214,974.90 francs for amortization, leaving a surplus of 553,930.18 francs which was carried to the reserve fund, which, with this addition, amounted on December 31 to 11,911,175.77 francs. This fund would have been two or three times this amount but for the system already alluded to by which a portion of the profits are divided every five years among the depositors.

The method and form of investment of the funds of a savings bank undoubtedly constitute the most important feature of its organization. The policy pursued in this respect determines the whole character of the institution. It is in this feature that the Belgium bank is unique among state savings institutions, and the reason why it merits the special interest and investigation on the part of the student of social institutions.

The French and other postal savings banks, as is well known, are required to invest all of their funds in bonds of the state or

[1] *Comte rendu des opérations et de la situation de la caisse générale d'épargne et de retraite, instituée par la loi du 16 Mars 1865, sous la garantie de l'état. Année 1898* (Brussels, 1899).

those enjoying a state guarantee. The result of this policy has been not only to decrease the earnings of the banks and therefore the rate of interest that they can afford to pay upon deposits, but to constitute a grave embarrassment and danger through the facility thus afforded to the state to borrow, and the enormous and rapidly increasing indebtedness the state is assuming toward the people. The government practically borrows from the people hundreds of millions of francs, the repayment of all of which may be demanded within a very short period of time. If, in case of a crisis, such a demand were made, the money could only be had by the savings bank selling the bonds in open market at a time when they would not produce anywhere near the amount given for them. An almost equal disadvantage of the exclusive investment of deposits in government securities lies in the withdrawal from circulation and the rendering inactive of large sums of money which should be invested in private capitalistic enterprises.

The Belgian legislators have succeeded in avoiding these dangers by boldly giving a far greater freedom than is usual to the administrators of the bank in the selection of the means of investing the bank's funds. The act of 1865 provided that the funds of the bank might be invested, not only in state bonds, but in the securities of the provinces, communes, and cities, in the obligations of Belgian companies, which for the five years immediately preceding had met all their engagements by means of their ordinary receipts, in loans on notes and real estate mortgages, and finally in the discount of bills of exchange and similar paper, and in the purchase of foreign state bonds. In fact, the bank is allowed to use a portion of its funds in most of the transactions permitted to ordinary commercial banks.

The provisions of the law of 1865, while giving great latitude in the matter of investments, have no other purpose in view than the safe and productive employment of the deposits. Beginning with the act of 1884, authorizing loans to the farming classes, an entirely new principle was introduced in the policy

of the institution, that by which the object sought in the investment of the funds was primarily the assistance of a social movement directed to the improvement of the condition of the laboring classes.

It is well recognized that the loan service of the ordinary commercial bank is of equal importance to that of its serving as the custodian of money, and there seemed to be no reason why this sphere of usefulness should be denied to a state bank. The General Savings Bank is a purely social institution for the benefit of the poorer classes. What more logical and suitable use could be made of the money coming from the people than in co-operating in the various movements for the improvement of their economic condition, the extent of whose operations could be greatly extended if more funds were placed at their disposal. The Belgian bank deserves the great credit of first recognizing this fact, and appreciating that its sphere of usefulness lay as much in the use of the money coming into its possession as in the mere act of facilitating its accumulation.

The experiment inaugurated in 1884 proving successful was subsequently extended in 1894, and in 1889 the still more important action was taken of permitting the loan of money to societies having for their object the provision of cheap and sanitary homes for the working classes. The character of the work done in this way is so peculiar and of such importance as to require a special description. Before doing so, however, the following statement, taken from the report of the bank for 1898, is given, in order to show the nature of the investments of all kinds of the bank at that date, and the relative importance of each class. In this statement the figures are given in round thousands of francs, as given in a recapitulation table of the official report.

Character of Investments	1893	1894	1895	1896	1897	1898
	In thousands of francs					
State bonds	150,092	157,220	158,706	152,485	176,417	188,514
Obligations of companies guaranteed by the state	24,297	23,668	23,316	34,291	34,307	34,252
Obligations of provinces and communes	38,246	46,023	54,154	62,444	69,595	76,099
Obligations of private companies	65,908	69,844	80,390	86,534	94,443	102,224
Loans on collateral	15,950	18,867	27,542	28,105	25,639	42,931
Loans on real estate mortgages	3,707	5,355	4,689	3,856	1,789	2,154
Discount of domestic paper	27,157	29,545	36,691	43,539	45,719	48,078
Discount of foreign paper	67,742	80,951	67,515	70,913	74,575	61,226
Agricultural loans	2,104	2,320	2,518	2,922	3,949	4,470
Loans for workingmen's houses	5,346	8,350	11,789	15,477	19,950	25,363

This table presents a very interesting exposition of this part of the bank's operations, for in it can be traced the gradual change that is taking place in the policy of the institution. In 1898 the funds of the bank invested in government bonds represented but 32.22 per cent. of its total investments, as against 37.47 per cent. in 1893; that in securities guaranteed by the state also decreased, though but slightly, being 5.85 per cent. in 1898 and 6.07 in 1893. The amount invested in the bonds of the communes and provinces has steadily increased. In 1893 this form of investment represented 9.55 per cent. of the total, and in 1898, 13 per cent. A similar gradual increase is seen in the investment made in the obligations of private Belgian companies, the percentage for this class increasing from 16.45 in 1893 to 17.46 in 1898. Ten years preceding this last date, or in 1888, such investments represented but 6.63 per cent. of the total. The relative importance of the discount operations and loans on collateral or real estate has remained about the same during the period covered by the table. If a period of ten years be considered, however, a substantial decline in their importance can be seen. Together, these four classes represented, in 1888, 34.11 per cent. of the total investments, as against but 26.38 per cent. in 1898. The most interesting showing is that of the steady increase in the extent to which the bank

is investing its resources in the social undertakings of farmers' loans and for the construction of workingmen's houses. For the former the increase, though constant, has been slow, the change being from 0.53 per cent. in 1893 to 0.76 per cent. in 1898. In the case of loans for workingmen's houses, however, the amount so invested has increased nearly fivefold during the six years, and in 1898 represented the important sum of 25,363,000 francs. This figure represents 4.33 per cent. of all investments, the percentage for 1893 being but 1.33. To recapitulate therefore, the significant features of the bank's policy brought out by this table are that less and less dependence is being placed upon government securities for investment purposes, and that their place is being taken by the obligations of private companies of proved financial stability, and by loans to the farming classes, and particularly to societies for the construction of workingmen's houses.

From a consideration of the general operations of the savings bank, we now pass to a more particular examination of those two special features having for their purpose the assistance of social movements, which, as we have seen, are constantly playing a more important part in the bank's operations.

Loans for workingmen's houses.—The study of the question of workingmen's houses in Belgium led to the belief there, as elsewhere, that the principles upon which action should be attempted were: first, to render the workingmen owners of their own homes, and secondly, to make them achieve this result as far as possible through their own efforts. To do this, however, a machinery—some means by which the money for building could be secured—was necessary. In the United States and in Great Britain admirable institutions for this purpose have been developed in the building and loan associations and building societies of these countries. It was readily seen that if feasible the best action that could be taken was to strive for the development of similar institutions in Belgium. Unfortunately, the economic condition and character of the Belgium workingman was such that the spontaneous development of such societies in Belgium

could not be anticipated. Not only is the capacity for organization of the Belgian workingman less than that of English or American laborers, but the regular contributions possible to these were beyond his resources. Assistance of some sort, therefore, was necessary.

This was sought and found in the co-operation of the general savings bank. The law of 1889, which was passed at the demand of those who had for years given the subject the closest attention, thus in its general aspects provides for the encouragement of the organization of building societies after the British and American pattern by permitting the general savings bank to make loans to them on very advantageous terms as regards the rate of interest demanded and the facilities of repayment in small instalments.[1] The system thus created is in fact much the same as where our own building associations cannot secure sufficient funds for their operations through the contributions of their members and borrow from banks or other institutions.

The law of 1889 relates to a good deal more than the participation of the General Savings Bank, but it is difficult to give an account of the rôle played by that institution without giving at least a brief description of all of its general features. The law may be said to embrace three fairly distinct parts, those relating to: first, the creation of local committees of propaganda, or patronage, as they are called; second, the regulation of the conditions under which money is loaned by the bank for building workingmen's houses; and third, the institution of a system of life insurance in connection with the loan, so that in case of the death of a workingman while in the course of paying for a house, the insurance money will liquidate the balance of his indebtedness.

The creation of committees of patronage was necessary, as there was little likelihood that the workingmen themselves would take the initiative to any sufficient extent. These committees

[1] This law was afterwards supplemented by the law of July 30, 1892, the purpose of which was to extend to loan societies certain fiscal advantages until then enjoyed only by the building societies proper.

are organized by the local governments in the different communes and provinces, and consist of public-spirited individuals who are interested in social questions or are competent to pass upon the technical problems relating to building and hygiene. Members serve without pay. The duties of these committees are to determine the needs of their districts, and particularly to bring about the organization of companies either by capitalists or by the workingmen themselves for the construction of workingmen's houses.

It is with the second and third features of the law, however, or those relating to the action of the general savings bank, that we are here most interested. The essential feature of the system under which money is lent by the bank for workingmen's homes is that it is never lent directly to the workingmen, but is advanced to a society which stands as an intermediary between the bank and the actual beneficiaries. The system thus contemplates the creation of four kinds of societies — joint-stock and co-operative building societies, and joint-stock and co-operative loan societies. The distinction between these different societies is sufficiently shown by their names. The loan societies are similar in purpose to our building and loan associations, in that they do no building, but merely lend money to workingmen for this purpose; while the building societies themselves construct buildings either for rent or sale to workingmen. The difference between the joint-stock and co-operative form of organization is that the former are organized by public-spirited individuals, while the latter are due to the workingmen's own efforts. All comprehend the repayment of any advances made on the installment plan.

These different forms of organization are necessary in order to meet the requirements of different conditions, and their distinctions must be borne in mind, because a somewhat different system of making loans to them has to be adopted by the bank in each case. To joint-stock societies the law permits the lending of money to the extent of one half their capital stock subscribed and not paid in, three fifths of the value of the real estate security held by them for loans they have made to

workingmen, and, in case they are building societies, one half of the value of the property owned by them. Advances to the same extent can be made to co-operative societies, with the exception that no advance can be made on account of unpaid stock. The capital of co-operative societies consisting only of the money accumulated in small installments or dues does not offer sufficient guaranties for the security of loans in respect to it.

To make this system clear, let us take the example of a joint-stock loan company with a capital of $100,000. Under the general law relating to joint-stock companies, 10 per cent. of the capital stock, or $10,000 must be paid in. The general savings bank then advances an amount equal to one half the unpaid stock, or $45,000. The company thus has immediately available $55,000 for loaning to workingmen. Let us suppose that this sum is loaned for the erection of $1000 houses. Under the law the borrowers must themselves furnish one tenth of the money required, or in each case $100. The company thus lends but $900 to each borrower, and is therefore able to make 61 loans, leaving a small balance in its possession. As fast as these transactions are concluded the general savings bank will make additional advances equal to three fifths of the value of the property, or $600 in each case and $36,600 altogether. These sums are again lent out together with the money received through the regular installments and interest paid by the borrowers; and so the operations of the company continue indefinitely, the security of the savings bank remaining always proportionately great.

The general rate of interest charged by the bank on its loans to the societies is fixed at 3 per cent It is specially provided, however, that in case of joint-stock loan companies which voluntarily limit their dividends to 3 per cent. and thus have partly the character of philanthropic organizations, the rate is reduced to 2½ per cent.[1] The rate of interest charged by the companies

[1] In 1892 the further condition was imposed that they should require all workingmen borrowing from them to contract life insurance with the bank.

on their loans to workingmen, however, is usually at the rate of 4 per cent., a slight increase being necessary in order to meet the expenses of operation.

Though the law authorizing this system was enacted in 1889, it was not until 1891 that the decree establishing the particular conditions under which it would be administered was published, and the system went into actual operation. From the time when work actually began, however, complete success has been achieved, and, as was shown in the table giving the form of investment of the funds of the bank during recent years, the extent of operations under the law is constantly increasing. The number of companies of each kind which had obtained loans from the bank and the amount of their loans on December 31, 1898, are shown in the following statement:

	Number	Amount of loans
Joint-stock loan companies	86	22,340,050.00
Joint-stock building companies	25	1,052,427.50
Co-operative loan companies	8	1,708,439.98
Co-operative building companies	1	24,500.00
Total	120	25,125,417.48

From this statement it will be seen that the general savings bank had outstanding on December 31, 1898, loans of over 25 million francs to companies whose exclusive work was the provision of workingmen's houses.

One of the most significant points brought out, however, is the comparatively slight extent of the work of co-operative societies. This is a demonstration of the necessity that existed for the assistance of the workingmen through the organization of societies by the wealthier classes. The education of a people in such matters as this is slow; as time goes on, greater dependence can possibly be placed on the workingmen themselves. It is to be remarked, however, that the joint-stock companies have almost exclusively been organized for philanthropic purposes. Of the total amount borrowed from the bank, 23,515,040 francs was at 2½ per cent., thus showing that most of the

companies had limited their maximum dividends to 3 per cent.

We now turn to the third, and, in some respects, most interesting feature of the system created by the law of 1889, that whereby workingmen who are acquiring houses through the system of partial payments, at the same time insure their lives in the general savings bank for the balance of the purchase price that may be due if they die before their houses are fully paid for. The purpose of this operation is obvious. A great hardship involved in the practice of buying a house through installments running a considerable number of years is the danger that the purchaser may die before the final payment is made, the result often being that the house must be sold to save the lender from loss, thus leaving the workingman's family unprovided for.

The system here inaugurated completely guards against this contingency. The law provides that there shall be created in the general savings bank a special service through which purchasers of houses from companies affiliated with the bank can at the time of making their contract, insure themselves against the contingency of their death occurring before their houses are paid for. This is done in the following way. When undertaking to acquire a house, the purchaser takes out with the general savings bank an endowment policy for the value of his loan to run for the period of time that installments must be paid for the purchase of the house. Thus, under the general scheme of an endowment policy, the bank will pay at the end of the period or upon the death of the insured, if it occurs before that time, a sum equal to the amount borrowed by the workingman from the loan or building company. To the premium required by this policy must be added the 4 per cent. interest paid to the loan company for the money advanced by it in order to ascertain the total installments required from the purchaser.

Published tables show exactly the amount of annual payments required under contracts of this kind running for 10, 15, 20, and 25 years. In separate columns are shown for each age from 21

to 55 years, the amount of the insurance premium, the amounts of the installment payments, with and without insurance, and the net cost of the insurance. These tables, though interesting, are too lengthy to be reproduced. The following explanation, however, will make clear their construction and use.

It is desired to find the annual payments required of a workingman purchasing a house through installments running a period of 10 years, the total obligation incurred being $1000, according to whether life insurance is taken out or not. According to general insurance principles, the premium required on an endowment policy of $1000 running 10 years is from $91.83 to $102.20, according to the age of the insured. Under this policy there will be paid by the general savings bank at the end of 10 years or on the death of the insured $1000, the exact sum required to liquidate the loan contracted by him in order to purchase his house. In the meantime, however, he has borrowed the $1000 from the loan company to pay for the house. Upon this he must pay 4 per cent. interest, or $40 a year. His total payments under this arrangement are thus from $131.83 to $142.20, according to his age.

If no insurance is contracted the annual installments required to meet the interest and liquidation of the principal in 10 years are $123.29. Subtracting this from the total payments required under the insurance system, it will be seen that the actual cost of the insurance is but the small sum of $8.54 for men 21 years of age, but naturally increasing with the age of the borrowers, amounting to $18.91 for those 55 years old. It should be remembered that under either of these arrangements the purchaser enters into immediate possession of his house, and therefore has no rent to pay. The advantages of the insurance scheme are so manifest that it has been almost exclusively selected. This is seen from the following statement showing the number of loans made to workingmen outstanding each year since the inauguration of the system, and the number with insurance.

Year	Number of loans	Number with insurance	Year	Number of loans	Number with insurance
1891	52	11	1895	4,360	3,443
1892	753	473	1896	6,110	4,914
1893	1,764	1,364	1897	8,078	6,560
1894	2,921	2,306	1898	10,712	8,601

In concluding this necessarily lengthy account of this branch of the operations of the general savings bank, one cannot refrain from expressing admiration for the ingenuity and skill with which the details of the system were worked out to meet the peculiar conditions and characteristics of the Belgian workingmen. The committees of propaganda take account of the lack of initiative among the workingmen and prevent the law from remaining a dead letter. They at the same time act as boards of information to the savings bank in regard to the standing and management of the societies wishing to obtain loans from it. Secondly, the policy of dealing only with companies acting as intermediaries between the bank and the workingmen, not only increased the security of the bank and shifted the great burden of looking after the details of loaning the money to workingmen, its repayment in small installments, and the like, but left the real work of providing and operating the machinery of building and loan societies to private initiative, where it properly belongs. Finally, in its scheme of combining life insurance with the contract of workingmen to purchase homes, it introduced the most valuable device brought forward in recent years in connection with the effort to improve the housing conditions of the working classes.[1]

Loans to the agricultural classes.—The problem of so-called agricultural credit is world wide. With the increasing use of credit in business transactions the difficulty with which it is obtained in the rural sections has been felt as a peculiar hardship. Throughout Europe efforts have been made to develop credit

[1] This system, it may be remarked, has been introduced into the United States by Dr. Gould in the City and Suburban Home Company of New York City.

institutions peculiarly suited to the farming class. As we have seen in our historical sketch, the first action taken in this direction by the general savings bank was in 1884. The system then created and afterwards extended by the law of 1894 is similar in many respects to that just described in advancing money for workingmen's houses, and therefore can be briefly described. The same leading principle of loaning only through intermediary societies is here followed. The farmers are encouraged to form mutual or co-operative credit societies, and loans are made to them by the bank. The details of the system under which the loans are made, and the guarantees against loss, are too complicated to permit of our entering upon their consideration here. The general system is that of our building and loan associations in advancing money to members.

For a number of years this part of the operations of the bank developed but slowly. Within recent years, however, the progress has been much more rapid. This has been due to the passage of the law of 1894, specially favoring co-operative credit societies. The interest originally charged by the bank on its loans was 4 per cent. In 1895 the rate was reduced to 3.75 per cent. for loans over 10,000 francs in amount and 3.50 for loans under that amount. The development of the system is shown in the amount loaned by the general savings bank to these societies. It increased, as we have seen, from 2,104,000 francs in 1893 to 4,470,000 francs in 1898. In this last year the number of co-operative credit associations recognized by the bank was 204, an increase of 39 over the preceding year. The indications, indeed, point to a decided growth in the system in the immediate future.

Old-age and invalidity insurance.—Turning now to the study of that part of the operations of the bank which relate to the provision of insurance against old age and invalidity, we in fact undertake the examination of what is almost an independent institution. This branch was created fifteen years before the general savings bank came into existence, and even after the two services were put under one management, their operations

and accounts were kept as distinct as if they were under separate administrations.

The essential character of the system of workingmen's insurance here provided has changed but little in the nearly fifty years of its history. The object of the bank is to offer an institution in which individual workingmen can provide for a pension in their old age, or when invalidated for labor, through small payments made during the active period of their lives, or in which large employers of labor, such as railroad or mining companies, so desiring, can insure all of their employees at the same time. In principle and practice the bank is purely voluntary in operation as regards its use either by employers or employees, and is self-supporting.

The distinction between individual insurance or that taken out by the workingmen themselves, and collective, or that secured by the employers, is an important one. The plan of individual insurance is, in general, such as would be offered by a private insurance company. The chief difference lies in the provision that depositors are not required to contract for a certain fixed pension, which would thus necessitate the regular payment of certain premiums. Each depositor is left entirely free as to the amount of his payments. A separate account is opened with each, and he then makes deposits as he is able. Each deposit gives a right to a pension, the value of which is determined according to the age of the depositor. The sum of these pensions constitutes the amount of the annuity to which he will ultimately be entitled. Each depositor thus knows at all times, by consulting the tables of the bank and his account book, the amount of the pension to which his payments entitle him.

The minimum age at which pensions begin to run is fixed at 50 years, but can be deferred until the depositor is 65 years of age, in which case, of course, the amount of the pension is proportionately increased. In case of invalidity resulting in inability to work, before the depositor reaches the age of 50 years, a pension is paid, the value of which is determined according to the amount of the payments that have been made and the age

of the depositor. In order to limit the work of this service strictly to the working classes, the maximum pension that can be acquired is limited to 1200 francs.

In both individual and collective insurance a choice is offered between two kinds of insurance; that obtained when the depositor desires his payments to be considered as alienated (*capital aliéné*), and that when he desires it to be considered as reserved (*capital réservé*). In the first case, provision is made simply for the constitution of an annuity after the depositor has reached the required age. In the second, the additional provision is made that on the death of the depositor all deposits that he may have made will be repaid without interest to his heirs, the principle of life insurance thus being combined with that of old-age pensions. It is needless to say that the same amount of deposits will give a right to a much larger pension in the former than in the latter case. The following table, published by the bank, will show the value of the old-age pension earned by depositors making a regular monthly payment of one dollar, according to the system of insurance selected, the age at which the first payment is made, and the age when the owner elects to enter upon its enjoyment:

Age at first payment	Alienated capital				Reserved capital			
	50 years	55 years	60 years	65 years	50 years	55 years	60 years	65 years
6	$105.32	$160.06	$255.84	$440.61	$64.65	$97.02	$153.31	$261.48
10	86.81	132.89	213.51	369.04	51.94	78.36	124.25	212.35
12	78.56	120.78	194.63	337.13	46.37	70.18	111.49	190.80
15	67.27	104.20	168.83	293.50	38.87	59.18	94.37	161.84
20	51.07	80.43	131.80	230.89	28.44	43.87	70.52	121.51
25	37.74	60.86	101.31	179.34	20.20	31.74	51.64	89.59
30	26.82	44.83	76.33	137.13	13.72	22.26	36.85	64.58
35	17.88	31.71	55.90	102.57	8.72	14.91	25.40	45.24
40	10.60	21.01	39.25	74.41	4.90	9.31	16.69	30.50
45	4.71	12.38	25.79	51.67	2.07	5.14	10.19	19.52
50		5.46	15.01	33.45		2.11	5.48	11.55
55			6.51	19.07			2.18	5.99
60				8.07				2.29
64				1.40				0.37

The history of the operations of this system shows a steady but slow extension of its work during the first five years of its

existence. Within the last four or five years, however, during which the subject of workingmen's insurance has attracted increased attention, the progress has been much more rapid. The annual reports, probably on account of the difficulty of determining at a given time the number of persons embraced under the contracts for collective insurance, do not show the number of existing accounts, but only the number of new accounts opened during the year. This latter information, however, shows the great rapidity of the movement during the past few years. During the past decade, 1889–1898, the number of new accounts opened during each year were 917, 1750, 3642, 3874, 3525, 4438, 5790, 10,549, 17,159, and 43,873.

This very rapid progress during the past two or three years has been almost entirely due to the increased extent to which the large employers of labor and the various local governments are making use of the bank for the insurance of their employees. Thus, while in 1893 but 4 communes and provinces insured their employees in this way, their number rose in 1894 to 12, in in 1895 to 30, in 1896 to 69, and in 1897 and 1898 to 144. The number of industrial and transportation companies doing the same increased during this period from 24 to 35. In point of fact, the work done by this insurance institution is of little importance as far as individual insurance is concerned, but is constantly increasing in the much more important branch of collective insurance.

The number of persons drawing pensions is naturally increasing from year to year. In 1895 their number was 2608; in 1896, 2810; in 1897, 3056, and in 1898, 3332. The annual payments required on the 3332 pensions in force December 31, 1898 amounted to 1,239,585.84 francs, the average value of the pension thus being slightly over 372 francs.

Life insurance.—But a very brief statement is required concerning this, the fourth service of the general savings bank. The provision of life insurance apart from that furnished in connection with loans for building workingmen's houses, was not authorized until June 21, 1894, and did not go into operation until 1896. The system has thus but barely commenced operations.

The law of 1894 directs the organization of an independent service under the General Savings Bank, for the provision of life insurance. The scheme devised offers to those desiring to contract insurance, a choice between three kinds of policies: that of, first, straight life, the payments of premiums, however, ceasing to be required after the insured reaches the age of 55, 60, or 65 years, as may be desired; second, mixed or endowment, where the policy is paid either upon death or upon the expiration of the endowment period, which may be 10, 15, 20, or 25 years; and third, the same policy except that it becomes payable upon the person insured reaching the age of 55, 60, or 65 years, as may be agreed upon, instead of at the end of a certain term of years.

Applicants must be at least 21, and not over 55 years of age, and pass the usual medical examination. Premiums are paid annually. Under no circumstances can a policy be forfeited. In case of nonpayment of premiums the policy is converted into one fully paid up, for the benefit of its holder. The tables of premium rates are constructed upon the basis of the English Life Table No. 3, 3 per cent. and 3 per cent. additional to meet operating expenses. The following table shows the value of the policy acquired through the annual payment of ten dollars under each form of contract according to these premium tables:

	Age at first payment					
	21	25	30	35	40	45
Straight life:						
Policy fully paid up at age 55 years	498.17	437.17	362.55	289.29	217.35	146.30
Policy fully paid up at age 60 years	525.56	467.21	396.33	327.38	260.51	195.67
Policy fully paid up at age 65 years	545.77	489.38	421.26	355.49	292.36	232.10
Endowment:						
Policy matures in 10 years	108.89	108.47	107.82	106.96	105.74	104.00
Policy matures in 15 years	169.80	168.57	166.69	164.14	160.56	155.47
Policy matures in 20 years	233.42	230.73	226.50	220.75	212.18	201.97
Policy matures in 25 years	297.97	292.74	284.65	273.74	259.06	
Policy matures at age 55 years	402.60	346.87	280.44	217.50	158.18	102.46
Policy matures at age 60 years	455.46	399.74	333.10	269.67	209.66	153.18
Policy matures at age 65 years	499.66	444.39	378.20	315.05	255.24	199.00

Operations under this system began July 24, 1896. During the balance of the year but eleven policies for a total capital of 50,931.50 francs were taken out. On December 31, 1898, there were in force 403 policies for a total of 1,580,452,30 francs. Of these, 296 were for straight life, and 107 for endowment policies. These figures would seem to indicate that the system of life insurance here offered is progressing but slowly. It is as yet, however, too early to foresee the ultimate importance that it may attain.

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PRICES AND INDEX NUMBERS.

THERE is today considerable confusion as to the significance or value of tables of prices and index numbers. The averages figuring in these tables have been a fruitful source of controversy. The arithmetic mean is most commonly employed, but W. S. Jevons advocated and employed the geometric method,[1] and F. Y. Edgeworth has suggested the median[2] as preferable to any other means for representing the average, at least, in a certain type of cases. The majority of statisticians favor the use of index numbers for determining the movement of prices, but M. G. Mulhall[3] regards the results given by index numbers as utterly fallacious, and N. G. Pierson,[4] by applying a criterion that appears to show glaring inconsistencies, has found justification for discrediting all attempts at discovering movements of prices.

Under the circumstances it will perhaps not be out of place to re-examine the premises to these conflicting views. With this in view this paper presents the following theses:

1. The arithmetic is the only rigorous method for computing averages.

2. Present systems of index numbers are defective, but the remedy is simple.

3. Periodic movement of prices can be accurately presented in the case of single commodities; in the case of a greater number of commodities the movement can be shown only when the quantities in the various periods are proportional.

I. METHODS OF TAKING AVERAGES.

In preparing tables of prices and index numbers it has been necessary to reduce lists of figures representing prices for various months or years, or for various commodities, to average values.

[1] *Investigations in Currency and Finance*, pp. 23, 24, 120 *et seq.*

[2] *Reports of the British Association for the Advancement of Science.*

[3] *History of Prices* (London, 1885), p. 7.

[4] *Economic Journal*, March 1896, p. 131.

Primarily it is a matter of importance that averages have been accurately computed. It would seem that for so simple a matter as taking an average there would be little excuse for uncertainty or confusion. To be sure, where considerations of weighting the figures enter, the question becomes somewhat complex. But aside from any such complexity, there has been by no means unanimity or certainty of opinion as to the proper method of taking an average. Jevons persisted in using what is known as the geometric method, and the influence of his name has been sufficient to perpetuate a considerable measure of doubt as to the merits of the various claims. To make matters worse, Jevons introduced into the controversy a new potential candidate for the honor of representing the average, namely, the harmonic mean. We have thus to consider three kinds of mean in relation to average—arithmetic, geometric, and harmonic. An arithmetic series, as is well known, is one that has a constant difference between the successive members, as 5, 8, 11, 14, etc., with the constant difference 3. A geometric series has a constant ratio between successive members, as 2, 4, 8, 16, etc., with the constant ratio 2. The harmonic series is not so simply stated as either of the above. For this discussion, the relation of this series to the arithmetic will afford the most intelligible and suggestive definition. If we express an arithmetic series in the form of fractions ($\frac{3}{1}$, $\frac{5}{1}$, $\frac{7}{1}$, $\frac{9}{1}$, etc.) and invert the various fractions, we have a harmonic series, as $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{7}$, $\frac{1}{9}$, etc. In any of these series, any member is a mean between its left-hand and its right-hand neighbors. For instance, in the harmonic series above, $\frac{1}{6}$ is the mean between $\frac{1}{5}$ and $\frac{1}{7}$. It needs only to be added here that between the same two quantities the arithmetic mean is numerically greater than the geometric, and the geometric is greater than the harmonic. For instance, between 4 and 25 the arithmetic mean is $14\frac{1}{2}$; the geometric, 10; the harmonic, $6\frac{2}{29}$. The three series are:

4, $14\frac{1}{2}$, 25 (arithmetic)
4, 10, 25 (geometric)
4, $6\frac{2}{29}$, 25 (harmonic)

The conception of average is so wrought into the consciousness from early life that it scarcely needs elucidation. Perhaps it should be said rather that it would need no elucidation, so far as this discussion goes, had not Jevons succeeded in enveloping it in a perplexing maze of uncertainty. One or two examples of averages, whose mere statement will compel assent, will suffice for our purpose. If two boys are aged, respectively, 6 and 10 years, their average age is 8 years, the arithmetic mean. $6+10=16$, and $8+8=16$. That is, the conception of an average is such that if the number of units in it be substituted in each term of the series to be averaged, the aggregate number of units is not changed. If a quantity fails in this test it must be discarded—it is not an average.[1] If two clocks are, respectively, 20 and 30 minutes fast, they average 25 minutes fast, the arithmetic mean. The last example may be put thus: If two clocks vary from the true time, respectively, by 20 and 30 minutes, their average variation is 25 minutes, the arithmetic mean. Why should we not say of two prices, say of wheat, if the price of one bushel is $1.50, and the price of another bushel[2] is $2.00,

[1] To the objection that this conception of an average is arbitrary, the reply is (1) that it conforms to ordinary usage, and (2) that no other conception is available to determine the price movement. This latter consideration, which has special importance in this discussion, is developed in the text. The movement of price can be determined by a comparison of ratios—the ratios of total prices, or values, as compared with the ratios of total quantities. The alternative and convenient method is by the use of averages, and it goes without saying that the two methods should tally in their results.

[2] It may not be amiss to caution against taking the simple average between the unit prices, in case of unequal quantities of a commodity. If 2 bushels of wheat sell at $1.00 per bushel and 3 bushels sell at $1.50 per bushel, the average price is not $1.25, but $1.30 per bushel, as follows:

2 bushels at $1.00 per bushel bring $2.00
3 bushels at $1.50 per bushel bring $4.50
Total, 5 bushels at a total of $6.50 is $1.30 per bushel.

The same result, of course, may be obtained by distributing the units of commodity with their prices, and taking the arithmetic average, as follows:

1 bushel at the rate of $1.00
1 bushel at the rate of 1.00
1 bushel at the rate of 1.50
1 bushel at the rate of 1.50
1 bushel at the rate of 1.50
Total, 5 bushels, at a total of $6.50, or $1.30 per bushel.

In Jevons's work, unequal quantities are scarcely considered. Whatever the relative quantities sold, the price of the unit is taken, and the computation based on

the average price for the two bushels is $1.75, the arithmetic mean? Or, if $1.00 be taken as the standard price for wheat, and we wish to get the average variation for two bushels sold, respectively, at $1.50 and $2.00, why will not the transparency of the following process vouch for the correctness of the result:

Bushel 1 varies from the standard price $0.50; bushel 2 varies from the standard price $1.00; hence the average variation is $0.75, or, adding $0.75 to the standard price, $1.00, the average price for the two bushels is $1.75 per bushel? If we express the relation of the varying prices by ratios or percentages of the standard price, the result is identical:

If bushel 1 sells for 200 per cent. of the standard price, and bushel 2 sells for 150 per cent. of the standard price, the average percentage for the two bushels is 175; or, if $1.00 be the standard, the average price for the two bushels is $1.75 per bushel.

In presenting the logic of his method for determining the average variation (see below), Mr. Jevons clouds the discussion by introducing two commodities.[1] So far as the particular point at issue is concerned it matters not whether we consider the variations applying to two periods and a single commodity, or those pertaining to two commodities and a single period. There are points of distinction affecting these two cases that will be taken up later; but at present, for the sake of simplicity, we will regard the two cases as one. Mr. Jevons's account of his selection of the geometric mean is as follows:

> Thus the price of cocoa has nearly doubled since 1845–1850. It has increased by 100 per cent., so that its variation is now expressed by the number 200. Cloves, on the contrary, have fallen 50 per cent., and are now at

that. The question of unequal quantities is one that will be considered in connection with the principle of "weighting," and it need not encumber the present discussion.

[1] The propriety or significance of averaging the prices, or the variations of prices, of commodities so diverse as yards of cotton and pounds of tobacco will be discussed in another place. Mr. Jevons takes the affirmative as to variations, but the question of the proper method of ascertaining an average in no wise depends on any concrete significance of the figures or numbers involved. Whether these latter represent real prices or fictitious or hypothetical prices, or erroneous variations, we are not now concerned to discuss.

50. The arithmetic mean of these ratios would be ½ (200+50) or 125. The average rise of cocoa and cloves would then appear to be 25 per cent. But this is totally erroneous. The geometric mean of the ratios expressed by the numbers 200 and 50 is 100. On the average of cocoa and cloves there has been no alteration of price whatever. In other words, the price of one is doubled, of the other halved — one is multiplied by two, one divided by two — on the average, then, the prices of these articles remain as they were, instead of rising 25 per cent.[1]

Now two methods of obtaining an average that yield diverse results cannot both be right. If one is right, the other must be wrong. Moreover the discrepancy between the results would have to be quite insignificant to justify the adoption of the inaccurate method on the ground of its greater simplicity. But Mr. Jevons accentuates the divergency of results and thus emphasizes the importance of accuracy in method. The plausibility of the reasoning quoted above arises from setting the two ratios 2 and ½ face to face, to offset each other. But the ratio 2 in the case cited corresponds to an advance of 100 points, while ½ corresponds to a decline of but 50 points. And if we contrast 100 with 50 it is certainly equally plausible that the former more than offsets the latter, so that the average should show a variation from the original prices.

It is not difficult to expose the speciousness of Mr. Jevons's reasoning. Division and multiplication are reverse processes, and it sounds plausible to say that multiplying by 2 and dividing by 2 are mutually neutralizing operations, but it depends entirely on the quantities operated on. If 100 be multiplied by 2, and then the product 200 be divided by 2, the original quantity 100 is regained; but if we perform the two operations on the same quantity, as does Mr. Jevons, the result is not so simple. He multiplies 100 by 2 and divides 100 by 2, and then by dwelling on the identity of multiplier and divisor, and ignoring the remaining elements of the problem, he reaches a chimerical conclusion. This sort of reasoning will not stand a practical test for one moment. If a man should make two investments of $100 each, and realize 200 per cent. on one investment and 50

[1] *Investigations in Currency and Finance*, p. 23.

per cent. on the other, Mr. Jevons's style of reasoning would figure out no reward for the investor's pains. Modern bookkeeping shows no such sterility in real transactions. The investor makes $100 on one transaction and loses $50 on the other, showing a net gain of $50.

Mr. Jevons adhered to the geometric mean in spite of adverse criticism, although he conceded some strength to the opposition, witness the following passage:

> The reasons for adopting the geometric mean were explained in my pamphlet, and I still think those reasons sufficient. I must mention, however, that the method has been called in question by Dr. E. Laspeyres. . . . . Dr. Laspeyres urges, if I read him aright, that as the value of gold meant its *purchasing power*, we ought to take the simple arithmetic average of the quantities of gold necessary for purchasing uniform quantities of given commodities.[1] There is certainly some ground for the argument. But it may be urged with equal reason that we should suppose a certain uniform quantity of gold to be expended in equal portions in the purchase of certain commodities, and that we ought to take the average quantity. This might be ascertained by taking the *harmonic mean*. Thus there are no less than three different kinds of averages which might be drawn.[2]

Mr. Jevons does not venture an explanation of how a harmonic mean is obtained under the stated conditions, but contents himself with mathematical illustrations of the three kinds of *mean*, and by means of an example educes the result that "the mean rise of price might be thus variously stated:

	Per cent.
Arithmetic mean	50
Geometric mean	41
Harmonic mean	33

It is probable that each of these is right for its own purposes when these are more clearly understood in theory." Then follow three remarkable reasons for adhering to his method:

> Because (1) it lies between the other two; (2) it presents facilities for the calculation and correction of results by the continual use of logarithms, without which the inquiry could hardly be undertaken; (3) it seems likely to give in the most accurate manner such general change in prices as is due

[1] *Hildebrand's Jahrbücher*, vol. iii. p. 97.

[2] *Ibid.*, p. 120.

to a change on the part of gold. For any change in gold will affect all prices in an equal ratio, etc.

The first two of these reasons are remarkable from Jevons's own original standpoint of the importance of accuracy. The third reason is remarkable in its contention, since a change on the part of gold is manifested in the same way as a change on the part of commodities, namely, in the prices; and the simple question of the average of prices, or the average of variations in prices, is not affected by the causes of those variations. If so, we might need a different method of computation for every cause of variation.

That the arithmetic mean gives the correct average will be obvious if the relation of price is stated in expanded form in terms of purchase. For instance, if one dollar purchase one bushel of wheat at one date, and one dollar at another date purchase two bushels, the two dollars purchase in the aggregate three bushels, which yield an average purchase of one and one half bushels for one dollar, or the arithmetic mean between one bushel and two bushels. Let us now describe what takes place if we reverse the terms of the problem. If one bushel purchase one dollar today, and one bushel purchase two dollars tomorrow, two bushels purchase in the aggregate three dollars, or one bushel on the average has a purchasing power of one and one half dollars, the arithmetic mean. This latter statement reflects with simple fidelity the mathematical relation involved in price changes, and establishes beyond cavil the correctness of the arithmetic method. The same result follows if we consider variations of price from a given standard instead of the prices themselves. For instance, if one dollar per bushel be taken as the standard price for wheat, and we wish to ascertain the average variation between two dollars per bushel and one half dollar per bushel, for which Mr. Jevons's method gives as the result no variation, the correct result is evident from the following process:

At two dollars, the excess for one bushel is -	$1.00
At one half dollar, the deficit for one bushel is -	50
The aggregate excess for the two bushels is - -	50

which gives an average excess of .25 to the bushel, showing the average price of the wheat to be $1.25, or .25 in excess of the standard taken.

Mr. Jevons intimates that a certain method of looking at the problem will yield a process that results in a "harmonic mean." As "harmonic mean" is indissolubly associated with "arithmetic mean," by definition, it follows that the harmonic mean can be made to emerge wherever the arithmetic mean figures in a result: but in this case the former certainly does not emerge as the correct register of an average. To illustrate:

(1) Given, $1 purchases 1 bu.
(2) Given, $1 purchases 2 bu.
(3) Result, $1 purchases 1½ bu. (Average).

1, 1½, 2 are in arithmetical progression, and if we compute the purchasing power of 1 bushel of wheat in terms of money at the three different rates, we get a harmonic progression, as follows:

At $1 per bu., 1 bu. purchases $1
At $1 per 2 bu., 1 bu. purchases $½
At $1 per 1½ bu., 1 bu. purchases $⅔

1, ⅔, ½ are in harmonic progression, ⅔ being the harmonic mean between 1 and ½. This harmonic mean does not express an average. It is evident that the average price of one bushel of wheat at the three rates of

1 bu. purchasing $1
1 bu. purchasing $½
1 bu. purchasing $⅔

is ascertainable by summing up the second column and dividing by 3, which is an *arithmetical* process. The harmonic mean, ⅔, in the above case is obtained by first forming an arithmetical series, the middle term of which denotes an average, and then, owing to the inevitable reciprocity of the problem, the conditions furnish the harmonic series that is inseparably bound up with the former. The arithmetic series is 1, 1½, 2, or $\frac{1}{1}$, $\frac{3}{2}$, $\frac{2}{1}$. Inverting each of these fractions we have 1, ⅔, ½, a harmonic series by definition. The harmonic series is bound up with the arithmetic series by the reciprocal relation of commodity and

price; or, to speak more accurately, by the reciprocal relation of the units that express quantitatively the commodity on the one hand and the standard of value on the other.

A writer in the *Quarterly Journal of Economics* for October 1886, seems to think that the character of an average, when pressed into the service of political economy, is so thoroughly fictitious that it is quite optional to employ one mean or another as fancy or circumstances may dictate.[1] If this were true, the labor of compiling tables involving averages would be indeed a useless and fruitless task. Fortunately, it is not true. This writer bungles distinctions. It is true that the average price does not register a concrete realty, but as a mathematical relation existing among *real* prices, it is as real and definite as the prices themselves. This means that fictitious averages are simply pseudo-averages, and result from erroneous computation.

It will be interesting to note into what a tangled web this notion of a fictitious average leads. As a notion, it is the creation of Jevons presented in his *Principles of Science*, chap. XVI. Its style of service may be briefly illustrated. Consider two commodities, one of which has remained stationary, or at 100 per cent., and the other has doubled in price, or advanced to 200 per cent. The arithmetic average is 150 per cent., or 50 per cent. advance. Now this number 150 marks a deviation of 50 from both 100 and 200; it therefore embodies an error of 50, when made to represent the one or the other. This saddles a greater proportional error on the smaller number, but as the choice of a fictitious average is under no sort of constraint, one has a right to favor the larger quantity. However, if the quantities are regarded equally important, the choice of the average would naturally fall on the harmonic mean. In the example cited,

[1] "Its fictitious character renders it possible to make choice among different values, and thus among different methods of finding it. This is generally overlooked by those who invariably use the arithmetic mean as if it were the only one which could be applicable. The only justification for any fictitious mean is to be found in its convenience as a representative of the true quantities. It is upon this criterion that Mr. Jevons based his choice."—F. COGGESHALL, "The Arithmetic, Geometric, and Harmonic Means."

133⅓ is the harmonic mean between 100 and 200, giving an error of 33⅓ and 66⅔, respectively, for the two quantities averaged, evidently an equitable apportionment, as 33⅓ and 66⅔ are, respectively, one third of 100 and 200.

The fanciful character of this conception of an error that requires distribution will appear, if we introduce some prices between these two extremes, 100 and 200, such as will not disturb the average. Suppose a third commodity has advanced to 133⅓ per cent., which will not disturb the average. Such a commodity would get no share of the error, and yet, according to the reasoning, this commodity is much better able to stand it than the one represented by 100 per cent. It is clear that if a number of commodities are to share an error in proportion to ability to stand it, the average cannot exceed the price represented by the minimum percentage in the scale of variation. For instance, if several commodities suffer variations from standard price, represented by 50, 51, 75, 125, 200 per cent. and the average must be taken so as to distribute the error according to the magnitude of these numbers, this average must be taken less than 50½. Now, if we introduce commodities whose scale of variation will fall between 50 and 50½, it is plain that our logic will push the average down to 50. Of course any figure lower than 50 will answer the same purpose.

The absurdity of the geometric method will be manifest if we consider cases of extreme variation. To begin with Mr. Jevons's illustration, a rise expressed by the ratio 2 is offset by a decline expressed by ½. In the same way a rise expressed by 4 is offset by a decline expressed by ¼; or, which is the same thing, if two commodities each double in price, their variation is offset by that of a single commodity declining to ¼ its standard price. By the same logic 100 commodities doubling in price would be offset by one commodity declining to $\frac{1}{2^{100}}$ its standard price. That is to say, one commodity by declining in price can offset any rise in all other commodities combined, and the result will be an average of no variation.

We can bring out the absurdity in a still bolder form. Let us take the case of a commodity that may have a compass of price, including zero, such as water. By the geometric method what is the average price of water between its extreme rates, taking the maximum rate, 2, and the minimum rate 0? The true average is the arithmetic mean, 1. The geometric mean is $\sqrt{2 \times 0} = 0$. That is, the average price of water by the geometric method would be its minimum price. The harmonic mean in this instance is the same as the geometric mean, and hence is equally absurd as representing an average. Indeed, the introduction of the harmonic mean can serve no other purpose than to cloud the transparency of a simple problem, and thereby furnish the pretext for a compromise between two so-called equally plausible results.

Professor F. G. Edgeworth has entered the lists with a novel suggestion for an average. Representing the variations in the prices of the various commodities by percentages, he writes these percentages down in the order of their magnitude, and selects the central member of the series as the average. For instance, if there are five commodities, and the percentages representing their variation are 75, 90, 95, 115, 125, the average variation is 95. Professor Edgeworth styles this mean the *median*. Its claims are earnestly urged in the Reports of the British Association for the Advancement of Science, 1888, 1889, in the *Journal of the Royal Statistical Society*, June 1888, and elsewhere.

The method of the median has the conspicuous merit of extreme simplicity, *conspicuous* because its *sole* merit. It is recommended by Professor Edgeworth to serve for a special sort of cases which he calls typical. "For the purpose of a mere average or type, we are to take account of all manner of goods, and we are not concerned with the quantity of each commodity. We have for this purpose only to ascertain the ratios or percentages . . . . and then to take a simple or unweighted mean of these ratios."[1]

[1] "Appreciation of Gold," *Quarterly Journal of Economics*, January 1889, p. 161.

This is the type of cases in which the method of the median is especially appropriate, according to Edgeworth. On the contrary, this is the type of cases that affords no pretext for deviating from the true or arithmetic method. Where data are deficient, it is possible that certain devices may furnish an approximate average, but in Edgeworth's typical cases, the data are all at hand, quantities are not considered—that is to say, the quantities are taken uniform for all commodities. In these cases the arithmetic method is eminently practicable as well as theoretically appropriate.

Professor Edgeworth is willing to indulge any prejudice in favor of weighting the percentages. "However, it may be admitted," he says, "that though there is no peculiar propriety in using a *weighted* mean for the present purpose, at the same time there is not much harm in doing so."[1] In another paper he makes the concession stronger. "There is a variety [of median] constituted by assigning special importance to those returns which we have reason to suppose are specially good representatives of the changes affecting the value of money."[2] Then follow proposals for weighting, according to one or two simple devices, which strike one as jocular rather than serious.

As Professor Edgeworth's median logically contemplates at best but an approximate result, it need detain us no longer.

II. THE DEFECT IN INDEX NUMBERS AND THE REMEDY.

The initial and simplest problem connected with prices or index numbers is to ascertain the comparative prices of a single commodity for successive periods. For convenience a period of comparative stability of the market is taken as the base period, and the prices of the various periods under consideration are compared with the average price for this period. If index numbers are used, the price of the base period is represented by 100, and all prices are reduced to the scale of this base. For instance, consider some specific commodity, as oats. If oats are rated at

[1] *Ibid.*, p. 162.

[2] *Report of the British Association for the Advancement of Science*, 1888, p. 207.

40c. per bushel during the standard period and rise to 50c. at a subsequent period, the index numbers for the two periods are 100 and 125. The important point here pertains to the method of ascertaining this price of 40c. or 50c. Of course, the figures denote the average price, but precisely how is this average computed? It is customary to take prices at stated times during the period, once a quarter, or once a month, and compute the simple average of the schedule thus obtained. This will usually answer for practical purposes, especially if the variation during the period is slight; but a higher degree of accuracy will be obtained by allowing for the differences of quantity sold at the different rates. If twice the quantity is sold at one rate as compared with another, the former rate should be taken twice in determining the average. To make the matter perfectly clear, take the following schedule for oats for a year by the month: January, 40c.; February, 50c.; March, 55c.; April, 45c.; May, 40c.; June, 40c.; July, 50c.; August, 55c.; September, 45c.; October, 35c.; November, 40c.; December, 45c. The simple average computed by adding the various figures and dividing by 12 is 45c., which ordinarily would be taken as the average. For the sake of simplicity of results we will suppose that equal quantities are sold by the month with the exception of October, which schedules the lowest price. It would not be a singular phenomenon if the low price should attract an unusual sale. If the quantity sold in October should be thirteen times as great as that for any other month, the price 35c. for that month should figure thirteen times in the sum, and the divisor should be 24 instead of 12, giving the result 40c., or 5c. less than the former result. This gives an importance to the price 35c. thirteen times as great as that for any other month due to the proportionally larger quantity for October. It is not usual to speak of "weighting" when considering a single commodity; but the propriety of so doing is perfect, as is evident from the above example, and the significance is clear. Strictly construing an average, it is the result of dividing the total proceeds of a commodity during the period, say a year, by the number of units

of the commodity involved in the transactions. If three million bushels and 1.2 million dollars be these totals, the latter divided by three million gives 40c. as the average price per bushel. The same result would follow, if the prices scheduled by the month were weighted proportionally to quantities sold, and the weighted figures entered into the calculation.

When we come to a plurality of commodities, the case is not quite so simple. Indeed the subject of averages and index numbers as applied to a variety of commodities has been a theme of endless controversy. Jevons justified the propriety of averaging *variations* in distinction from the prices themselves as follows:

> There is no such thing as an average of prices at any one time. If a ton of bar-iron costs £6, and a quarter of corn £3, there is no such relation or similarity between a ton of iron and a quarter of corn as can warrant us in drawing an average between £6 and £3; and similarly of other commodities. If at a subsequent time a ton of iron costs £9, and a quarter of corn £3 12s., there is again no average between these quantities. We may, however, say that iron has risen in price 50 per cent. or by ½; what was previously 100 has become 150; corn has risen 20 per cent. or by ⅕; what was 100 has become 120. Now the ratios 100: 150 and 100: 120 are things of the same kind, but of different amounts, between which we can take an average.[1]

The above statement is so far erroneous that almost the exact reverse is true. It is a very simple matter to take the average price of any number of thinks alike or unlike, as is evident from the conception of an average; but in general it will be found impossible to take an average between variations.

But first let us examine some of the methods of averaging that have obtained more or less sanction and prestige. Jevons used, generally speaking, unweighted prices or index numbers. That is, if the index numbers for a variety of commodities for any period were found to be, say, 90, 105, 99, the average index number would be simply the sum divided by 3. Most statisticians at present reject this sort of an average. They insist that the prices, for instance, of salt, mercury, wheat and beef cannot be summed up and divided by 4, with any significant result.

[1] *Investigations in Currency and Finance*, p. 23.

Professor Edgeworth, however, approves this very process as applicable to one of his species of averages:

> For the purpose of a mere average or type, we are to take account of all manner of goods, and we are not concerned with the quantity of each commodity. We have for this purpose only to ascertain the ratios or percentages, such as
>
> $$\frac{\text{Present price of anchovies}}{\text{Original price of anchovies}} \qquad \frac{\text{Present price of alkali}}{\text{Original price of alkali}} \qquad \frac{\text{Present price of beef}}{\text{Original price of beef}}$$
>
> and then take a simple or unweighted mean of these ratios. . . . . This rule will excite the mirth of some. What, they will say, assign the same importance to pepper and nutmeg as cotton and iron! Yes, I reply, for the present purpose, etc.[1]

If we could ignore quantity our problem would be much simplified; but the plain truth is, that if we do ignore quantity, we vitiate our results. The simple average of the prices of pepper, nutmeg, cotton and iron cannot be taken with any significant result, for the reason that such an average would not correspond to the phenomena of actual facts. Such an average price could not be applied to each of the four commodities, to get the total proceeds from the real transactions of any period of time under consideration; and an average price has no meaning unless it satisfies this condition. The simple average as taken by Professor Edgeworth can apply only to a hypothetical case. If we suppose a unit of each of the commodities to be sold at a specific rate, the average rate for these several transactions is the simple average; but such a case affords no instruction for the problem engaging us.

This point is so important in our discussion that it will warrant a simple and careful presentation. We have seen[2] that in the case of a single commodity, an average has to do essentially with quantities. If a bushel of wheat sells for $1.00, and a second bushel for $1.50, the average for the two bushels (quantity)

[1] "Appreciation of Gold," *Quarterly Journal of Economics*, January 1889, pp. 161–162.

[2] See footnote, p. 173.

is $1.25. Now if two bushels sell at $1.00 per bushel, and three bushels sell at $1.50 per bushel, the average price is not $1.25. This would ignore quantity. If $1.25 is substituted for the two rates, $1.00 and $1.50, the five bushels aggregate $6.25, whereas in the real transaction we get

2 bushels at $1.00 per bushel,	=	$2.00
3 " $1.50 "	=	4.50

or five bushels aggregate $6.50. The true average price is $6.50 divided by 5 (quantity), or $1.30.

Now it would be passing strange if the factor of quantity, so indispensable in the case of a single commodity, could be ignored when a plurality of commodities is concerned. The truth is that it is this very ignoring of quantity (the ignoring altogether, or the inadequate providing for quantity by recourse to arbitrary systems of weighting) that has led to divergent and unsatisfactory results.

The meaning will be clear by taking a simple example. If the average prices of wheat and rye are $1.00 and .50 for a specific period, it will not do to take the simple average of $1.00 and .50 (or .75) for the average price of the two commodities. Suppose the transactions in wheat for the period are four million bushels, for rye one million bushels; we have

4,000,000 bushels at $1.00 per bushel,	=	$4,000,000
1,000,000 " .50 "	=	500,000
or 5,000,000 " at a total of		4,500,000
Now 5,000,000 " at .75 per bushel	=	3,750,000

proving the inadequacy of the simple average, .75. The true average is obtained by dividing the total proceeds, 4.5 million dollars by the total number of bushels involved, five million (quantity), which yields .90 as the correct result. Ninety may be substituted for the prices of wheat and rye without affecting the totals, the decisive test of a correct average.

In the above example of wheat and rye, but one species of unit is involved, the bushel. Let us now consider the case involving different units of quantity. Let us see whether there is any significance to an average price between bar iron and corn.

Jevons says there is not. "If a ton of bar iron costs £6, and a quarter of corn £3, there is no such relation or similarity between a ton of iron and a quarter of corn as can warrant us in drawing an average between £6 and £3." Immediately, however, as quoted a few pages back, he goes on to show that we can draw an average between their *variations*, because variations may be represented as percentages or ratios, and ratios "are things of the same kind . . . . between which we can take an average."

Is not price a homogeneous relation the same as ratio, and susceptible to the same sort of comparison and manipulation? Has ratio a superior sort of homogeneity? It is difficult to see wherein. The fact is that homogeneity is not a sufficient criterion here. We are considering relations, and Jevons draws an average between relations, neglecting meantime the objects related, and then he applies the result to the objects. It has been shown that such a proceeding is invalid in case of prices, and price has a *primary* relation to the object. Quantity must be taken account of. Now the ratios referred to here are primarily relations among the prices, and hence stand in a *secondary* relation to the objects themselves; so that the application of averages of ratios to the objects must be a more precarious matter than in the case of the immediate relation of price. It will appear later that ratios, homogeneous as they are, have to be handled with discriminating recognition of quantity to reach an intelligent interpretaion of results.

With the *prices* themselves for a single period the case is different. If the price of iron is £6 per ton, and that of corn £3 per quarter, we may get the average price, but first we must take into account the quantity of each commodity. Say the volume of business in iron for a specific period is 100,000 tons; for corn 200,000 quarters. If the average prices for the two commodities are £6 and £3, we have

100,000 tons of iron at £6, = £600,000
200,000 quarters corn at 3, = 600,000

Total, 300,000 units of the two commodities aggregate £1,200,000, or £4 per unit as the average for the two commodities.

That this is the true average may be proved by substituting it in the computation as follows:

100,000 tons at £4	=	£400,000
200,000 quarters at £4	=	800.000
Total,		£1,200,000

as above.

If it be objected that it is absurd to speak of £4 as applied to a ton of iron, since it may be that iron never sold as low as that figure, the reply is that £4 does not purport to be the price of iron; it as an average price taken between two commodities. One might with equal propriety object to averaging the prices of two grades of corn on the ground that the better grade never sold as low as the average. The confusion arises from not keeping in mind the significance of the concept, average, which is nothing more or less than a vicarious quantity, which, when substituted for the quantities that it replaces, does not change the totality of units comprehended in these various replaced quantities. In the above case, the average £4, substituted for £6 and £3, does not increase or diminish the totality (£1,200,000) of units contained in the quantities, £6 and £3, taken the proper number of times, namely, 100,000 and 200,000 respectively.

We must now establish the *nexus* between price schedules and index numbers. The convenience and attractiveness of the latter are such that the incentive to use them in price statistics is great. On the face of it, there is nothing simpler and more logical than the subsitution of a convenient scale of ratios for a schedule of prices. For instance, 100, 80, 125, 200 may be substituted for 20, 16, 25, 40, and the former schedule operated on by all the processes of division, multiplication, etc., involved in the taking of averages, and the results applied to the latter schedule, with complete confidence in the trustworthiness of the conclusions. All that is necessary in the above case is to divide every result obtained from the former schedule by 5. This is evidently valid, since 100, as representing a price, may stand for

the same *value* as 20. If 20 denote that number of *cent* units, changing 20 to 100 simply reduces the unit, *cent*, to *one fifth of a cent*. In the one case, we have 20 *cents;* in the other case, we have 100 *one fifth cents*. The numbers, 100, 80, 125, 200 must yield as trustworthy results as the proportional numbers, 20, 16, 25, 40. In fact, as shown above, they must yield identical results.

And yet the use of index numbers has been condemned on the ground that they give inaccurate results. M. G. Mulhall[1] pronounces a sufficiently sweeping condemnation which is equally appropriate as against the genuine schedule of prices. He takes it for granted that index numbers mean unweighted numbers. If the proper weights be applied, his objections lose their force. A more serious objection charges essential erroneousness to the principles of construction of index numbers. N. G. Pierson[2] and C. W. Oker[3] urge in strong terms the untrustworthiness of this instrumentality for measuring price variations. Their modes of presenting the subject are sufficiently distinct, but the principle in the two cases is the same, so that a single examination will suffice. Pierson's illustrations accentuate the discrepancies in the results more strongly than those of Oker. We quote from the former:

> Let us suppose ten commodities, all equally important. Five of them are doubled in price, and five of them fall exactly to one half. Supposing these ten commodities to have been equally cheap or dear before the changes occurred, it is evident that their average price will have risen 25 per cent.
>
> | First period | Second period |
> |---|---|
> | $5 \times 100 = 500$ | $5 \times 200 = 1000$ |
> | $5 \times 100 = 500$ | $5 \times 50 = 250$ |
> | $10)\overline{1000}$ | $10)\overline{1250}$ |
> | 100 | 125 |
>
> The index numbers in this table give a correct account of the alteration which has taken place; they show a rise from 100 to 125.

[1] *History of Prices*, 1885, p. 7.

[2] *Economic Journal*, March 1896.

[3] JOURNAL OF POLITICAL ECONOMY, September 1896.

But if we had started from the *second* period, expressing the initial prices in percentages of the prices as they were after the change, we should have found something quite different.

First period	Second period
$5 \times 50 = 250$	$5 \times 100 = 500$
$5 \times 200 = 1000$	$5 \times 100 = 500$
$10)1250$	$10)1000$
125	100

In this case the index numbers would have shown a fall instead of a rise.

The above criticism chronicles a fatal objection to index numbers, as they have been constructed. Professor Edgeworth,[1] in the same number of the *Journal*, undertakes to meet the objection; but the "Defense" is not based on a denial of Pierson's theoretical contention, but in the fact that the latter's illustrations are not typical; they are extreme hypothetical cases, created to magnify what in actual experience is an insignificant source of discrepancy.

To sum up, several of Mr. Pierson's objections amount to this one: that the calculation of average variations in prices is untrustworthy because the result is seriously different according as different systems of weighting are employed. And the objection, though true in the abstract of artificially simplified index numbers, is not true of the sets of figures with which we have actually to deal.[2]

Edgeworth's reply is inadequate. The objection that Pierson raises is real. The system of index numbers as constructed and used has a fundamental imperfection that vitiates the results. A slight change, however, will remedy the defect, and will enable the system to secure absolutely accurate and uniformly consistent results. Mr. Pierson himself trod on the very heels of this remedy, but it managed to elude his grasp. In speaking of his illustrations, he says:

The first table shows the effect of variations in the value of commodities of which prices were originally *equal:* the second table applies to commodities of which prices were originally *unequal.* Each percentage of a high price has a greater arithmetical importance than each percentage of a low one. But the system of index numbers takes no account of this difference.[3]

[1] "A Defense of Index Numbers."

[2] *Economic Journal*, March 1896, p. 136.

[3] P. 128.

This last sentence contains the key to the situation. Index numbers *should* take account of this difference. The defect in them springs out of this omission. It is futile to take unequal prices and deal with them as though they were equal, expecting the laws of mathematics to condone the offense. But this is just what the present system of index numbers does. It represents $5 and $50 and .05 indiscriminately by 100, without even an apology for the unwarranted proceeding. Now it is plain, in case of two commodities, one priced at .05 and the other at $50, that if the former advances 100 per cent., making its price .10, and the latter remains stationary, there is not an average advance of 50 per cent., not certainly if a unit only of each commodity is considered, or the same number of units. But index numbers bring about this fantastic result as follows:

For the .05 commodity, $200 \times 1 = 200$
For the $50 commodity, $100 \times 1 = 100$

$$2\overline{)300}$$
$$150$$

or 50 per cent. average increase.

The trouble comes from representing each commodity by 100 without making compensation. How different the result if we make proper compensation. The $50 commodity and the .05 commodity may be represented by the same number 100; but we must remember that in so doing we virtually change the unit of quantity without allowing for the change, .05 being $\frac{1}{1000}$ of $50, if we represent the price of the $50 commodity by 100, we may take the same number 100 to represent the other commodity, *only* if we at the same time increase the unit of the latter to one thousandfold. The price of this thousandfold unit will then be $50, the same as that of the first commodity. However, as we had but *one* of the smaller units, we have now to consider $\frac{1}{1000}$ of the thousand-fold unit, and our table stands thus,

For the .05 commodity, $200 \times \frac{1}{1000} = .2$
For the $50 commodity, $100 \times 1 = 100.0$

$$1.001\overline{)100.2000}$$
$$100.1-$$

that is, the average advance for the two is not quite .1 per cent. instead of 50 per cent.

Mr. Pierson's first table gives the correct result, because he stipulates that the articles have the same initial price, so that he is justified in assigning the index number 100 to each commodity or each group. In his second table he takes the second period as the base period, but, the prices having diverged, he is not warranted in assigning the same index number to each group without making the proper compensation. We can easily readjust this table, so as to show the same average variation as the first table. The price of the first group of commodities in the second table being four times that of the second, we may consider a fourfold unit of each of this second group, and represent the price of this new unit identically with that of the first group. We now have to consider $\frac{5}{4}$ units of the second group ($\frac{1}{4}$ unit of each member of this group) with the following result:

1st period	2d period
$5 \times 50 = 250.0$	$5 \times 100 = 500$
$\frac{5}{4} \times 200 = 250.0$	$\frac{5}{4} \times 100 = 125$
$6.25 \overline{)500.00}$	$6.25 \overline{)625.00}$
80	100

This table shows the same average advance, 25 per cent., as the first table of Mr. Pierson, and is the true record of the variation.

It is plain that the trouble with index numbers arises from subsituting for a set of miscellaneous prices one uniform number 100, instead of using proportionals throughout, as the inflexibility of mathematical principles enjoins. Statisticians, however, have considered it convenient to use one uniform base number, 100; and mathematics is sufficiently indulgent to permit this innovation also, but she demands rigorous compensation, as outlined above.

It will be noticed in the examples cited that a correct system of index numbers requires a strict recognition of quantity, in order to secure accurate results. Quantity is essential whether we use the schedule of actual prices or substitute index numbers.

Mr. Pierson entirely loses sight of this imperious necessity, and, in the latter part of his article, he turns hopeless pessimist on the question of computing average variations of prices by any method whatever. It would be possible, he grants, if we had one uniform standard of measure, but the inevitable variety leads to inextricable confusion and despair. By changing the unit from one of weight to bulk, Mr. Pierson finds that the transposition evokes a veritable wizard who changes plus into minus, and, by a subtle magic, transforms increase into decrease. The process is as follows:

> Now let us suppose that—
>
> 100 pounds of A are equal to 1 bushel
> 100 pounds of B are equal to 0.5 bushel
> 100 pounds of C are equal to 2 bushels
>
> Then, if each of the three articles is worth 20s. per hundred pounds, they will be worth per *bushel*,
>
> A - - - - - - 20s.
> B - - - - - - - 40s.
> C - - - - - - - 10s.
>
> Supposing commodity A to rise 25 per cent., B to fall 50 per cent., and C to rise 50 per cent., this would affect the average price as follows:
>
> If the price is expressed per 100 pounds,
>
> A will rise from 20 to 25s.
> B will fall from 20 to 10s.
> C will rise from 20 to 30s.
>
> 60 to 65s.
>
> Which means an average rise from 100 to 108.3s. But if the price is expressed per bushel,
>
> A will rise from 20 to 25s.
> B will fall from 40 to 20s.
> C will rise from 10 to 15s.
>
> 70 to 60s.
>
> Which means an average fall from 100 to 85.7.
>
> Thus it would simply depend on the method of expressing the price—per 100 pounds or per bushel—whether an average rise or an average fall were recorded.
>
> I do not see my way out of this difficulty and the only possible conclusion seems to be that all attempts to calculate and represent average movements of prices, either by index numbers or otherwise, ought to be abandoned.[1]

[1] P. 131.

This trick of transposition from pounds into bushels, by which an advance is changed into a decline, is easily exposed. It is accomplished by an unavowed substitution of quantities. With the figures showing the advance from 60 to 65s., 100 pounds of each commodity are taken. When reduced to bushels the quantities vary, but Mr. Pierson, for the sake of having the quantities uniform, deliberately and naïvely makes the change without realizing its significance. Let us see the result when we adhere to the original quantities expressed in the new standard:

1	bushel of A rises from	20 to 25s.
0.5	bushel of B falls from	20 to 10s.
2	bushels of C rises from	20 to 30s.
		60 to 65s.

or, of course, the identical result that Mr. Pierson finds in the first instance. This amounts simply to weighting for quantity. The quantities being 100 pounds for each commodity, when we change to bushels, we must weight A with the coefficient 1, B with ½, C with 2, and the transaction may be expressed as follows:

	Coef.	Importance.	Price.
A	1 ×	1 = 1.0 @	20s. = 20s.; 25% advance gives 25s.
B	1 ×	½ = 0.5 @	40s. = 20s.; 50% decline gives 10s.
C	1 ×	2 = 2.0 @	10s. = 20s.; 50% advance gives 30s.
			60s. to 65s.

Mr. Pierson's trick can be performed without transforming into bushels by simply modifying the quantity of each article so as to express the equivalence of 1 bushel, and then ignore the quantitative discrepancy. Instead of 100 pounds of each article we have by this arrangement:

100 lbs. of A	command 20s.;	25% advance gives 25s.
200 lbs. of B	command 40s.;	50% decline gives 20s.
50 lbs. of C	command 10s.;	50% advance gives 15s.
	70s.	to 60s.

Of course, as thus performed, the trick is no trick at all, because the change of quantities is so obtrusive that no one is deceived.

III. THE EQUIVALENCE OF THE TWO METHODS, PRICES AND INDEX NUMBERS; THE CHARACTER AND LIMITATION OF THEIR SERVICE.

Index numbers properly constructed are as trustworthy as tables of actual prices. They are neither more nor less reliable. They give and must give proportionate results with the severe certainty of mathematical law. In case of single commodities, either method will indicate accurately the price relations among the various periods. Either method will give, for any isolated period, the correct average price of all commodities. In case the quantities of each commodity for the various periods are proportional, either method will give the correct general movement of price, giving the ratios of the average prices of all the commodities between period and period as accurately as in the case of single commodities. Both methods are powerless beyond this point. The bounds of their capacity are rigorously set at this limit. Neither method is competent when the quantities become disproportionate. We will establish these propositions by means of examples that are simple and at the same time decisive.

The first example, exhibited in Tables I to IV, involves proportional quantities. Table I is constructed of actual prices. Tables II, III, IV employ index numbers. The four tables present the same phenomena with harmonious results. Any table can be readily transformed into any other by the use of simple mathematical formulæ. The method and rationale of the changes have been already indicated. The last three tables take the first, second and third periods respectively, as base periods. To transform Table I, for instance, into IV, the third period is taken as the base period, and 100 represents the price of each commodity. As 90 ($0.90 may be read 90c., so as to avoid the complication of the decimal point) is the actual price of wheat in the third period, 100 may be regarded as the price of $\frac{1}{90}$ of a bushel; so that the relations of Table I will be preserved in IV if we change the unit of quantity from 1 bushel to $\frac{1}{90}$ of a bushel, and at the same time apply a compensatory ratio to the number of units, *i. e.*, take $\frac{90}{100}$ of 100, or 90, as the

TABLE I.

Commodity	Unit	Price	Units (Quantity)	Total value	Price	Units (Quantity)	Total value	Price	Units (Quantity)	Total value	Av. price for three periods	Total units (Quantity)	Total value for three periods
Wheat	1 bu.	$ .80	× 125 =	$ 100.00	$1.00	× 475 =	$ 475.00	$ .90	× 100 =	$ 90.00	$ .95	× 700 =	$ 665.00
Sugar	1 cwt.	4.00	× 200 =	800.00	5.00	× 760 =	3,800.00	6.00	× 160 =	960.00	4.96⅔	× 1,120 =	5,560.00
Wine	1 gal.	5.00	× 50 =	250.00	4.00	× 190 =	760.00	3.00	× 40 =	120.00	4.03⅓	× 280 =	1,130.00
Totals			375	$1,150.00		1,425	$5,035.00		300	$1,170.00		2,100	$7,355.00
Average price of all commodities (Price of composite unit)				$ 3.06⅔			$ 3.53⅓			$ 3.90			$ 3.50 5/21

TABLE II.

Wheat	1 bu.	100	× 125 =	12,500	125	× 475 =	59,375	112½	× 100 =	11,250	118¾	× 700 =	83,125
Sugar	½ cwt.	100	× 1,000 =	100,000	125	× 3,800 =	475,000	150	× 800 =	120,000	124 5/25	× 5,600 =	695,000
Wine	4/25 gal.	100	× 312½ =	31,250	80	× 1,187½ =	95,000	60	× 250 =	15,000	80⅐	× 1,750 =	141,250
Totals			1,437½	143,750		5,462½	629,375		1,150	146,250		8,050	919,375
Average price of all commodities (Price of composite unit)				100			115 5/25			127 4/25			114 87/175

TABLE III.

Wheat	1 bu.	80	× 125 =	10,000	100	× 475 =	47,500	90	× 100 =	9,000	95	× 700 =	66,500
Sugar	½ cwt.	80	× 1,000 =	80,000	100	× 3,800 =	380,000	120	× 800 =	96,000	99⅔	× 5,600 =	556,000
Wine	¼ gal.	125	× 200 =	25,000	100	× 760 =	76,000	75	× 160 =	12,000	100 8/15	× 1,120 =	113,000
Totals			1,325	115,000		5,035	503,500		1,060	117,000		7,420	735,500
Average price of all commodities (Price of composite unit)				86 4/15			100			110 8/15			99 44/71

TABLE IV.

Wheat	10/9 bu.	88⅔	× 112½ =	10,000	111⅓	× 427½ =	47,500	100	× 90 =	9,000	105⅚	× 630 =	66,500
Sugar	⅛ cwt.	66⅔	× 1,200 =	80,000	83⅓	× 4,560 =	380,000	100	× 960 =	96,000	82 1/12	× 6,720 =	556,000
Wine	⅛ gal.	166⅔	× 150 =	25,000	133⅓	× 570 =	76,000	100	× 120 =	12,000	134 1/7	× 840 =	113,000
Totals			1,462½	115,000		5,557½	503,500		1,170	117,000		8,190	735,500
Average price of all commodities (Price of composite unit)				78 74/117			90 70/117			100			89 88/91

number of the new units, $\frac{1}{9}^0$ bushel × 90 = 1 bushel × 100. This, of course, gives the identical total value, 9000. Likewise with sugar and wine. Sugar rated at 600 per cwt. is equivalent to a rating of 100 per $\frac{1}{6}$ cwt. And dividing the unit into six units increases the number of units sixfold, or 160 becomes 960. In case of wine, 100 substituted for 300 as the unit price changes the unit of quantity from 1 gallon to $\frac{1}{3}$ gallon, and the number of units from 40 to 120. The *price* columns and the *number-of-units* columns of the various periods sustain the same ratios between the two tables as those of the base periods.

Table III is constructed on the same plan as Table IV, the base period being the second instead of the third. The total value columns of I, III, IV are identical, as logically they should be. Table II exhibits a variation in this respect, as it is constructed on a slightly different plan, to show that different methods may be employed, if the application of principle is rigorous. In Table II, instead of changing the unit of quantity from 1 bushel to $\frac{5}{4}$ bushel for wheat, to compensate for the substitution of 100 for 80 in the price, the unit 1 bushel is retained, which necessitates the retention of 125 as the number of units. This raises the total value to 12,500. Now every individual transformation of this table must take account of this arbitrary manipulation of the price of wheat. This is done, in case of sugar, by changing the unit of quantity to $\frac{1}{6}$ cwt., instead of $\frac{1}{4}$ cwt., when 100 is substituted for 400 in the price column. This preserves the proportions between the corresponding data for wheat and sugar. $1 : \frac{1}{6} :: 400 : 80$. That is, if 80 and 400 are each to be represented by 100, and the unit of the 80 commodity to remain unchanged, then, to preserve the original relations, the unit of the 400 commodity requires to be divided into 5 units. Of course, the number of units for sugar must be increased fivefold. A simpler way to get at this transformation is to increase the figures in the price columns of Table I 25 per cent. uniformly. Then the transformation is reduced to the method employed with III and IV. This is equivalent to changing the unit of value. If 80 is replaced by 100, that means that we

have 100 *eight tenths-of-a-cent* units instead of 80-*cent* units, so that the increased figures do not change the original values. The total value columns have their figures increased 25 per cent. That is, instead of 80, we have 100; instead of 400 we have 500, or $\frac{5}{4}$ instead of 1. But the unit is reduced by the same ratio. Instead of 1c. the unit is $\frac{4}{5}$c., so that the corresponding columns in the two tables express identical values. This transformation is more complicated than the other, because it involves a change in the unit of value as well as changes in the units of quantity. It is given merely as an indication of the protean possibilities of systems of index numbers.

The point of vital importance in these tables, is the absolute correspondence. Not only do the prices of the single commodities for the various periods and their averages exhibit the same proportions in all the tables, but the average prices of all the commodities for any single period, and the general averages are rigorously proportionate. Test the results of Tables I and II:

	1	2	3	General average
Averages by Table I	$3.06\frac{2}{3}$	$3.53\frac{1}{3}$	3.90	$3.50\frac{5}{21}$
Averages by Table II	100	$115\frac{5}{23}$	$127\frac{4}{23}$	$114\frac{67}{322}$

$$\frac{100}{306\frac{2}{3}} = \frac{115\frac{5}{23}}{353\frac{1}{3}} = \frac{127\frac{4}{23}}{390} = \frac{114\frac{67}{322}}{350\frac{5}{21}} = \frac{15}{46}$$

or, taking the ratios between corresponding periods, including the general average, in the two tables, we have

$$\frac{3.53\frac{1}{3}}{3.06\frac{2}{3}} = \frac{115\frac{5}{23}}{100} = \frac{53}{46}$$

$$\frac{3.90}{3.06\frac{2}{3}} = \frac{127\frac{4}{23}}{100} = \frac{117}{92}$$

$$\frac{3.50\frac{5}{21}}{3.06\frac{2}{3}} = \frac{114\frac{67}{322}}{100} = \frac{1471}{1288}$$

Similar relations exist between any two tables. The movement of price is indicated with absolute uniformity and unerring accuracy by all the tables.

In the case of disproportionate quantities there is a different story to chronicle. In order to present striking results, let us follow Professor Pierson's plan of supposing cases that exhibit

TABLE V.

Commodity	Unit	Period 1 Price	Period 1 Units (Quantity)	Period 1 Total value	Period 2 Price	Period 2 Units (Quantity)	Period 2 Total value	Period 3 Price	Period 3 Units (Quantity)	Period 3 Total value	Av. price for three periods	Total units (Quantity)	Total value for three periods
A	1 bu.	$ .05	× 10	= $ .50	$ 1.00	× 73	= $ 73.00	$ .25	× 972	= $243.00	$ .30	× 1055	= $ 316.50
B	1 cwt.	20.00	× 5	= 100.00	34.00	× 1	= 34.00	4.00	× 104	= 416.00	5.00	× 110	= 550.00
C	1 gal.	2.00	× 84	= 168.00	.50	× 24	= 12.00	40.00	× 7	= 280.00	4.00	× 115	= 460.00
Totals			99	$268.50		98	$119.00		1083	$939.00		1280	$1,326.50
Average price of all commodities (Price of composite unit)				$ $2.71\frac{81}{99}$			$ $1.21\frac{41}{98}$			$ $.86\frac{789}{1083}$			$ $1.03\frac{810}{1280}$

TABLE VI.

A	20 bu.	100	× $\frac{1}{8}$	= 50	2000	× $3\frac{13}{80}$	= 7,300	500	× $48\frac{13}{80}$	= 24,300	600	× $52\frac{15}{80}$	= 31,650
B	$\frac{1}{10}$ cwt.	100	× 100	= 10,000	170	× 20	= 3,400	20	× 2080	= 41,600	25	× 2200	= 55,000
C	½ gal.	100	× 168	= 16,800	25	× 48	= 1,200	2000	× 14	= 28,000	200	× 230	= 46,000
Totals			$268\frac{1}{2}$	26,850		$71\frac{13}{80}$	11,900		$2142\frac{13}{80}$	93,900		$2482\frac{15}{80}$	132,650
Average price of all commodities (Price of composite unit)				100			$167\frac{3413}{7180}$			$43\frac{17413}{21540}$			$53\frac{12041}{21540}$

TABLE VII.

A	1 bu.	5	× 10	= 50	100	× 73	= 7,300	25	× 972	= 24,300	30	× 1055	= 31,650
B	$\frac{1}{4}$ cwt.	$58\frac{3}{4}$	× 170	= 10,000	100	× 34	= 3,400	$11\frac{3}{4}$	× 3536	= 41,600	$14\frac{3}{4}$	× 3740	= 55,000
C	2 gal.	400	× 42	= 16,800	100	× 12	= 1,200	8000	× $3\frac{1}{2}$	= 28,000	800	× $57\frac{1}{2}$	= 46,000
Totals			222	26,850		119	11,900		$4511\frac{1}{2}$	93,900		$4852\frac{1}{2}$	132,650
Average price of all commodities (Price of composite unit)				$120\frac{319}{333}$			100			$20\frac{287}{4511}$			$27\frac{1}{4}\frac{8}{8}\frac{3}{3}\frac{3}{3}$

TABLE VIII.

A	4 bu.	20	× $2\frac{1}{2}$	= 50	400	× $18\frac{1}{4}$	= 7,300	100	× 243	= 24,300	120	× $263\frac{3}{4}$	= 31,650
B	$\frac{1}{4}$ cwt.	500	× 20	= 10,000	850	× 4	= 3,400	100	× 416	= 41,600	125	× 440	= 55,000
C	$\frac{1}{40}$ gal.	5	× 3360	= 16,800	$1\frac{1}{4}$	× 960	= 1,200	100	× 280	= 28,000	10	× 4600	= 46,000
Totals			$3382\frac{1}{2}$	26,850		$982\frac{1}{4}$	11,900		939	93,900		$5303\frac{3}{4}$	132,650
Average price of all commodities (Price of composite unit)				$7\frac{8}{8}\frac{1}{4}\frac{7}{6}\frac{3}{8}\frac{8}{5}$			$12\frac{1}{8}\frac{1}{5}\frac{3}{3}\frac{0}{8}\frac{0}{3}$			100			$25\frac{8}{8}\frac{8}{0}\frac{8}{6}\frac{4}{7}\frac{3}{8}$

extraordinary variations. They are collected in Tables V to VIII. Table V exhibits the phenomena by means of actual prices. Tables VI, VII, VIII employ index numbers, the base period moving from 1 to 2 and then to 3, in the successive tables. These tables are constructed after the simple plan of Tables III and IV, so that the total value columns of the four tables are identical. As in the first set of tables, we have the variations of prices for the single commodities exactly corresponding in the four tables. We may note also that the average prices for each period are correctly computed, since any average substituted for all the prices averaged will not change the aggregate of the total value column in that period. But these latter averages have no further significance. There is no correspondence between the tables. Let us place the four sets in parallel rows:

	1	2	3	General average
Averages by Table V	2.71 +	1.21 +	.86 +	1.03 +
Averages by Table VI	100	167 +	43 +	53 +
Averages by Table VII	120 +	100	20 +	27 +
Averages by Table VIII	7 +	12 +	100	25 +

Comment on this exhibit is superfluous. The marked discrepancy of the ratios—the ratios corresponding to those that are absolutely uniform in the first set of tables—shows beyond question that the movement of general prices cannot be accurately drawn, when the quantities are disproportionate.

The rationale of this result is not far to seek. The average price for any period may be taken as the price of a composite unit. For instance, in Table V, period 1, the average price, $\$2.71\frac{81}{99}$ may be taken as the price of a composite unit made up of $\frac{10}{99}$, $\frac{5}{99}$, and $\frac{84}{99}$, respectively, of the conventional units of A, B, C. In period 2 of the same table, the composite unit corresponding to the average price, $\$1.21\frac{43}{98}$, has for its constituent elements $\frac{73}{98}$, $\frac{1}{98}$, $\frac{24}{98}$, respectively, of the same conventional units of A, B, C. These two composite units are strikingly diverse. The one contains, as compared with the other

$\frac{10}{99}$ against $\frac{73}{98}$ of the conventional unit of A
$\frac{5}{99}$ " $\frac{1}{98}$ " " " B
$\frac{84}{99}$ " $\frac{24}{98}$ " " " C

They are thus obviously dissimilar units, and no inference can be drawn as to the movement of price between the two periods. Similar divergence applies to all the composite units of this second set of tables. No two units are alike; hence no significant comparison between their prices can be drawn.

Let us turn now to the first set of tables. Table I, period 1, has a composite unit consisting of $\frac{125}{375}$, $\frac{200}{375}$, $\frac{50}{375}$, respectively, of 1 bushel of wheat, 1 cwt. of sugar, 1 gallon of wine. For period 2, the ratios are $\frac{475}{1425}$, $\frac{760}{1425}$, $\frac{190}{1425}$. These ratios are the same as those of period 1, for

$$\frac{125}{375} = \frac{475}{1425} = \frac{1}{3}$$

$$\frac{200}{375} = \frac{760}{1425} = \frac{8}{15}$$

$$\frac{50}{375} = \frac{190}{1425} = \frac{2}{15}$$

That is, the composite units for these two periods are identical, containing each $\frac{1}{3}$ bushel of wheat, $\frac{8}{15}$ cwt. of sugar, $\frac{2}{15}$ gallon of wine. The third period obviously has the same composite unit. Hence the average prices are prices of the same units or things, and comparisons are legitimate. The same is true of the three index tables of this set, and it must be true of all tables of proportionate quantities that are correctly constructed.

In the first set of tables, the periodic averages are of identical units; in the second set, they are of diverse units. In the former case, the composite unit, being constant through the various periods, may be regarded as the unit of a constructive single commodity, and its variations in price are amenable to the same laws with those of any single commodity. In fact, for our purpose, such a commodity, or constructive commodity, belongs to the same category as, say, lead-pencils, knives, spectacles, sewing-machines, a thousand and one articles which are composite, but have a stable association of their parts.

In the second set of tables, the composite unit is exceedingly unstable. It varies from period to period in every table, and the variations are so radical that comparison of prices is absurd.

One might as well talk of the movement of prices in the case of two periods, one of which shows an exclusive business in cattle, the other in railway ties. Nevertheless we need not go as far as Professor Pierson, even in the case of disproportionate quantities, and abandon the enterprise entirely. The hypothetical case of our tables is not typical in the sense of fairly representing the changes of any actual observation. It has served its purpose in substantiating the claim that general movements of prices cannot be accurately measured. But there can usually be an approximate measurement, the approximation becoming near or remote as proportionality among the quantities advances or recedes. If the quantities are fairly proportional, the method of Sauerbeck, Edgeworth, Marshall, and others may be employed, namely, the application of the quantities belonging to some one period, the initial, final or mean period, to all the periods uniformly. This method should usually give approximate results. Similar approximation may be secured without disturbing the actual quantities. The averages for each period may be accurately obtained. These averages, as explained above, will relate to diverse units, but these units will be approximately uniform to the same degree that the quantities are proportional, or approach proportionality.

It may be said in closing that there need be no lack of occasions to utilize the services of price tables in perfectly trustworthy operations. All enterprises that aim at ascertaining the periodic ratios of real wages of laboring or other classes are movements in the right direction. The budget method of Dr. Falkner and others, involving the consideration of constant quantities, should secure accurate results. Besides, the spirit of such an enterprise appeals to the approbation of all who are actuated by philanthropic motives.

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REASONABLE RAILWAY MAIL PAY.

In a previous article on railway mail compensation I intimated that at a later time I hoped to discuss what may be considered "fair" pay for the transportation of mail. As an elaborate discussion of this question has just been submitted to the postal commission by Professor Henry C. Adams I shall forego an extended statement of my own ideas and content myself with a review of his testimony.[1]

I.

Before stating the fundamental principles which should govern rate making Professor Adams thought it necessary to clear the field of certain preconceptions on this subject that seem to have become firmly rooted in the minds of many witnesses and of several of the members of the commission. With but few exceptions the witnesses who appeared before the commission based their judgment of the reasonableness of the mail pay on the cost of rendering the service. One representative of the railroads after another contended that the present compensation is not excessive, because it costs nearly as much to carry the mail as the railroads receive from the government for performing the service. The line of argument, adopted by the railroads, is difficult of explanation, for the accounting officers of the railways have more than once placed themselves on record that it is impossible to separate accurately even passenger train from freight train expenditures and consequently they would concede that an attempt further to distribute the cost of running passenger trains to mail, express, and passengers would be even more unsatisfactory. Perhaps the men who represented the railroads before the commission were not familiar with railway accounting. But it also occurred to me, as I read the testimony, that the railway men may have attempted to justify the compensation they received on the basis of cost of service because they felt that this was the line of argument the majority of the commission wanted. And whatever may be said of their attempts from a theoretical standpoint all will have to admit that the arguments, based on the cost of

[1] Professor Adams's testimony may be found in the *Report of the Joint Congressional Commission on Postal Affairs.* This report has not yet appeared in its final form, so the page cannot be cited.

service, were the ones that found favor with the commission. Indeed some members of the commission found it difficult to give a respectful hearing to those who were not prepared to state just how much it cost to haul a ton of mail a mile.

While admitting, that the simplicity of the rule that rates should approximate the cost of service makes it attractive, Professor Adams declared that he could not accept the doctrine that reasonable rates must approximate the cost of service because, (1) it is impossible to ascertain the cost of service with sufficient accuracy for this purpose, and (2) because the railways do not attempt to adjust the rate on any commodity to the cost of moving that particular commodity.[1] His explanation of why it is impossible to find out how much it costs to perform a certain service is very convincing.

After having disposed in this summary way of the arguments based on the cost of service Professor Adams, for the time being, passes over the statements of the railroad men whose arguments are based on comparisons,[2] and presents his "fundamental principles relative to railway mail compensation." He says, quoting his words as far as possible, that the points which will be submitted in connection with a consideration of the fundamental principles relative to railway mail pay are (1) that European experience relative to railway mail transportion is not pertinent to the United States, (2) that the problem of railway mail pay must be approached as one of compensation, that word being given its regular interpretation, (3) that in view of the nature and history of the postal service the claim of public utility in determining what is reasonable compensation cannot be ignored, and (4) that the possibility of introducing economies into the business of transportation, depends upon the increase in the volume of traffic, from which, in the absence of countervailing considerations, it follows that a form of traffic which increases most rapidly through a series of years should show a relatively more rapid decrease in changes [charges] as compared with other traffic.

II.

Now let us examine these fundamental principles. Professor Adams says in explanation of the first one that "Very little can be

[1] *Testimony taken by the Joint Congressional Commission on Postal Affairs in the winter of 1899*, pp. 4–7.

[2] Most of the railroad men compared their earnings from mail with those from express. This was the favorite comparison, it being held that the two services were similar in many respects.

gained from European experience respecting the questions of compensation to railways for transporting mail on account of the fact that, for one reason or another, European governments are interested in the financial success of the railways. Where the railways are the property of the government, as in Prussia, every item of railway expenditure appears as an appropriation in the budget of the state, and it is merely a matter of accounting, so far as the people who pay taxes and railway charges are concerned, whether the railways transport the mail for nothing, and thus enable the post-office department to show a surplus, or whether the post-office department is charged an arbitrary rate for carrying the mail, which would enable the railway department to increase the surplus by that amount.[1]

If by European experience Professor Adams means simply continental practice no one, I believe, will be disposed to find fault with his contentions. But, popularly at least, Great Britain forms a part of Europe and, therefore, Professor Adams should not have directed his investigation simply to the continent of Europe. In Great Britain the relations of the post-office department and the railroads are very much the same as in this country. In both countries there is private ownership of railways. And further, our principles of jurisprudence do not depart greatly from those of English jurisprudence. Because of these considerations it seems to me especial attention should have been directed to the manner in which the British government deals with the railways. And failing to find in Great Britain sufficient confirmation that the payments of our government are either too high or too low Professor Adams could much more profitably have turned his attention to Canada than to the continent of Europe. Having thus neglected the practice of those countries whose national and industrial life are adjusted to the same principles as our own, I cannot regard Professor Adams's treatment of his first point as satisfactory.

Although not much can be learned from British practice as to what constitutes reasonable compensation in dollars and cents, a great deal can be learned as to what is a fair method of ascertaining that to which the railways are entitled. In this country the schedule of pay is fixed arbitrarily by act of Congress. I say arbitrarily because the railways have no direct voice in determining the payments. In Great Britain on the contrary, they participate in fixing the payments, for any company which does not regard the payments awarded by the

[1] *Ibid.*, p. 7.

postmaster-general as adequate, can call arbitrators. The nineteenth section of the Act of 1838 reads:

> Every railway company shall be entitled to reasonable remuneration for any services performed by them in pursuance of this act with respect to the conveyance of mails, and such remuneration shall be paid by the postmaster-general. And any differences between the postmaster-general and any railway company as to the amount of such remuneration, or as to any other question arising under this act, shall be decided by arbitration[1] in the manner provided by the act of the session of the first and second years of the reign of her present majesty, chapter XCVIII, or, at the option of such railway company, by the [railway] commissioners.[2]

In regard to specific information as to what is regarded as fair pay for conveying the mail but little information is obtainable, for in Great Britain the postmaster-general does not make public the contracts he enters upon with each of the railways. During the summer of 1898, the second-assistant postmaster-general, W. S. Shallenberger, was sent abroad by Postmaster-General Charles Emory Smith to make a careful investigation into the character and cost of railway mail transportation. In reporting to the postmaster-general what he learned in Great Britain, Mr. Shallenberger says:

> "In reply to a question as to what was regarded a reasonable compensation for a mail train, I was told that it must not in any event exceed the revenue derived by the railway company from an average passenger train of like size. . . . . One of the contracts that I was permitted to see provided that the postmaster-general and his officers may require the company to provide and run any express or special trains for the conveyance of mails, etc., for a payment at the rate of 3s. 6d. for each and every mile such express or special *train* shall travel. This would be at the rate of 85 cents per running mile. In the testimony given by this office before the subcommittee of the Senate Committee on Appropriations, in May last, the cost per running mile of one of our full railway post-office *cars* including transportation pay, was estimated at 25½ cents. Considering the small size and light weight of the cars on English roads, it is perhaps fair to assume that three of our full [sized] railway post-office cars would equal the average special train provided for in the contract which I have named.[3]

[1] In case the postmaster-general and a railway company cannot agree as to what is fair compensation they may refer the matter to the award of two persons, one to be named by the postmaster-general and the other by the company, and if these two persons cannot agree, then to a third person, to be appointed by the first two previously to their entering upon the inquiry.

[2] *Report of Postmaster-General*, 1898, p. 318.

[3] *Ibid.*, p. 320. The italics are mine.

If the terms of the contract just cited are typical, it appears that the compensation given the railroads in Great Britain for running special mail trains is somewhat higher than it is here. In comparing payments it must also be held in mind that in Great Britain the conditions of the service are not so onerous as here. In Great Britain the post-office department erects and maintains at its own expense all mail cranes and catchers, the railways are also relieved from conveying the mails to and from the post offices, and when railway post-office clerks are injured in railway accidents, and judgment is obtained against the company, the post-office department is liable at least for one half the damage, and finally, but most important of all, the railways are not expected to run their mail trains at a higher rate of speed than their best passenger trains maintain.[1]

In Canada, as in Great Britain, the railways are not paid on the basis of the average weight carried, so no direct comparisons on the basis of weight can be made with our payments. From information collected in the autumn of 1898 for the postal commission by Mr. V. J. Bradley, superintendent of the railway mail service of the New York post office, it appears that the cost per mile of railway mail transportation in Canada, regardless of facilities furnished or weight carried, was 8.9 cents.[2] In the United States for the fiscal year 1898 it was 10.93 cents.[3] Although on its face this comparison seems unfavorable to our railways, it is in reality very favorable. This is true for several reasons. In the first place Mr. Bradley, in ascertaining the average amount paid in Canada per mile for railway mail transportation, did not include the payment of about $650,000 to the Canadian Pacific by the imperial government for the overland transmission of mail to the Pacific.[4] In the second place, the average weight of mail carried in Canada is insignificant in comparison with the average weight transported here. In this country most of the railways radiating from the large cities run fast mail trains, exclusively devoted to mail, while in Canada there are no fast mail trains, and in fact there is but a single route on which full railway post-office cars are

[1] *Ibid.*, p. 319.

[2] *Testimony taken by the Joint Congressional Commission on Postal Affairs in summer and autumn of 1898*, p. 729.

[3] *Report of the Postmaster-General*, 1898, p. 301.

[4] *Testimony*, etc., *1898*, p. 728.

run.[1] It thus appears that for baggage and apartment car service the railways of Canada receive almost as much per mile as our railways receive for service that consists largely of full sized post-office cars and full trains. In Canada the conditions under which the railways transport the mail are not so burdensome as in this country. There, as a general rule, the side and terminal messenger service is performed by the post-office department at its own expense. In case the railroads perform this service they generally receive extra compensation for doing it. In Canada the railways are also almost wholly relieved from the porterage of the mails at the stations. The railways render some assistance, but about 90 per cent. of this work is done by postal employees. At stations where transfer agents are assigned by the post-office department they do not merely supervise the transfers, as in this country, but lug the mail as well.[2]

III.

Now let us pass on to Professor Adams's second fundamental principle for determining what is fair pay for transporting the mail. In his testimony before the postal commission he says:

> The next point is that the problem of railway mail pay must be approached as one of compensation, that word being given its regular interpretation.
>
> * * * * * * * * *
>
> The service rendered by the railways in carrying the mail is of the same sort as that of carrying passengers, express, or freight. The fact that in the case of mail the government is the agency through which the service is rendered does not change the nature of the service. Such I understand to be the principle that must be recognized by your commission. This is implied in the Constitution itself, and has been expressed in many state decisions. Much testimony might be submitted to show that the above situation is correct, and that consequently the principle of compensation should be acknowledged in discussing the question of adequate pay. . . . In 1874 a select committee of the United States senate was appointed to inquire into "the nature and extent of the obligations subsisting between the railway companies and the postal service of the country." This committee came to the conclusion that the government can compel them [the railways] to transport the public mails, but that "reasonable and just compensation should be paid

[1] This is the Montreal-Toronto route, which is 333 miles in length. The cars on this route are forty feet in length, and there are two round trips made daily except Sunday, when a single round trip is made. To maintain this service seven cars are furnished, four in use and three in reserve.— *Ibid.*, p. 726.

[2] *Ibid.*, pp. 726, 727.

for such service." In this regard, as also in the case of condemnation of a railway which refuses to carry the mail, the argument of the committee proceeded upon the principle enunciated by the fifth section of the amendments to the Constitution, which reads: "Nor shall private property be taken for public use without just compensation." It seems evident, then, that the question of railway pay for postal service among peoples who enjoy English jurisprudence is a question of compensation, and that all those principles of law and political science that cluster about the word "compensation" are pertinent, to a greater or less degree, to the problem in hand.[1]

Probably no one will be disposed to question Professor Adams's second fundamental principle, and probably there are but few who would dignify the simple contention "that the problem of railway mail pay must be approached as one of compensation," by calling it a fundamental principle. It seems to me Professor Adams might fairly have assumed that the members of the postal commission would freely grant that "the principle of compensation should be acknowledged in discussing the question of adequate pay," for compensation and adequate pay mean the same thing. All are agreed, I believe, that the railways should receive compensation or adequate pay for the services they render. From the questions put to the witnesses who appeared before it, it may be fairly inferred that the postal commission from the very beginning of its investigations granted the contention that Professor Adams labors to establish, for it began at once to search for information as to what is reasonable pay for carrying the mail.

IV.

The first two fundamental principles laid down by Professor Adams do not shed much light upon what is reasonable pay for transporting the mail. They in reality merely prepare the way for the introduction of the third and fourth principles which contain the meat of what Professor Adams has to say on what is reasonable compensation.

Passing from his second to his third principle, Professor Adams says:

> The third point found under the general heading "Consideration of fundamental principles relative to railway mail compensation," is as follows: The commission cannot in view of the nature and history of the postal service, ignore the claim of public utility in determining reasonable compensation. . . . . This consideration assists the solution of the problem in

[1] *Testimony*, etc., *1899*, pp. 8 and 9.

three ways. First, it suggests the correct classification of the mail service among the several transportation services.

* * * * * * * * *

The railways undoubtedly have the right to insist, from their point of view, that the character of the facilities furnished for the mail service should be taken into account in fixing compensation, and the government is obliged to recognize this claim because they who invest in railway property are a part of the state whose private interests are included in the interests which the state must guard; but, on the other hand, the government has the right to insist that the transportation of mail is essential, not alone to the present advantage of the public, but to the healthful and permanent development of the state. It has the right openly, publicly, and without apology, to put in practice a rule acknowledged by railway management. A railway manager is willing, for example, to carry coal at a very low rate, even at the risk of incurring loss, because he knows that coal is potential industrial development and what he loses on the coal traffic becomes for him a gain on the transportation of high-class freight, the product of the mills and factories which the distribution of the coal renders possible.

* * * * * * * * *

This line of reasoning is, even in a higher degree, pertinent to the transmission of intelligence, because intelligence is an essential consideration for growth and development. As the distribution of coal, which is latent manufacturing power, is essential to the upbuilding of manufactories, so the diffusion of intelligence is a fundamental condition of all social and industrial evolution. The meaning of all this is evident. When the government, in considering the question of compensation for carrying mail, finds it necessary to classify the mail service in the general schedule of services rendered, it will, if it accept the principle of public utility as the ruling consideration, conclude that the transportation of mail should be classed among those services which minister to the development of the process of production rather than to the satisfaction of wants through the transportatation of the products. From the social point of view there is a difference between the carrying of mail and the carrying of coal, and it is right that a schedule of rates conforming to the principle of public utility should recognize this difference. But of all things transported by rail intelligence is the most essential to social and economic advantage and therefore is in the highest degree amenable to the consideration of public utility.

* * * * * * * * *

This principle of public utility will, in the second place, be of assistance in bringing such action as the commission deems wise into harmony with the generally accepted rule relative to reasonable railway transportation.

Now the practical effect of that point of view, if conceded, would be, I think, to recognize that from the public point of view we have a right — the government has a right — to force the mail compensation rather low, provided it does not force it so low that the question of compensation ceases to be a question of compensation and becomes a question of taxation, and the most that statistics can do in this matter is to set up the broad mark between those two lines.

* * * * * * * * *

The private interest in railway charges is limited to the claim that the gross revenue of railways should be adequate to cover operating expenses, fixed charges, and a fair return to stockholders. But this amount having been guaranteed the manner in which this gross amount is to be collected from the shippers is a matter of public policy, and you can readily see how this view of the case clears the ground for such action relative to compensation for carrying the mail as may commend itself to Congress. The application of the principle of public utility classifies mail transportation with freight: it classifies it among the fundamental or social services of railways, and it justifies an unusually low rate upon mail transportation, provided this is essential to rendering the important service undertaken by the postal department, and provided that the railways are permitted to recoup themselves by higher rates from other relatively less important services.

* * * * * * * * *

The third scope of this principle of public utility is, that the combination of the idea of public utility with that of compensation emphasizes the distinction to be made later between the transmission of intelligence which is a primal postal function, and the transmission of merchandise or bulky literary products, which as a postal function is of comparatively recent development.[1]

* * * * * * * * *

While I cannot agree with all that Professor Adams puts forth in his third fundamental principle, yet most of his statements may well be accepted. The cost of service theory of rate making is abandoned. And as would be expected, he assumes that it is impossible to pass upon the fairness of any railway charge independently of the other rates with which it forms a system. In other words he contends that the whole classification must be examined before it is possible to pass judgment upon any particular rate. He premises that a railway company is entitled to a fair return upon the value of its property. And that the problem to be solved is the proportion in which the different commodities transported by the railway shall be called upon to contribute to this end. Or in other language how are the services

[1] *Ibid.*, pp. 9–11.

rendered by the railways to be classified? He declares that the "social services" should be performed at unusually low rates. After stating his theory of rate making he says "The application of the principle of public utility classifies mail transportation with freight: it classifies it among the fundamental or social services of railways, and it justifies an unusually low rate upon mail transportation." From this statement it must be inferred that in Professor Adams's grouping of the services rendered by the railways there are some which are not social. At this point I depart from Professor Adams. All the services rendered by railways are social services.

It appears to me that Professor Adams's theory is also incomplete. As I have before stated I regard all the services performed by the railways as social services. And I would advance as a fundamental proposition that the rates on these services should be so adjusted as to make the railways promote the public welfare in the largest possible degree it being understood that railway investors are first of all entitled to a fair return upon their property. In the presentation of his fundamental principles Professor Adams takes, or at least appears to take, a one-sided view of the situation. In a certain sense he looks upon railway property and employees as outside of the social community but ministering to it. And consequently in rewarding the railways for services rendered, he says, society is to consider merely the importance of the service to itself and then fix the compensation on the basis that services of great social importance should be done at very low rates. This view appears to me to be unsatisfactory. Railway property and employees are a part of the community and, therefore, the cost of performing a service in labor and capital must also be considered. That is, society is interested in net results. To make my point clear let me illustrate. Suppose that at station A for productive purposes a ton of coal is equal to a cord of wood but that the cost in labor and capital of transporting a cord of wood from station B to station A is twice that of hauling a ton of coal.[1] Obviously it would be greatly to the interest of society as a whole for the people at station A to use coal and therefore a system of rates based solely on the utility of coal and wood to the people at station A would not result in the most effective use of the railroads to society as a whole. Professor Adams may reply to this argument that my theory is of no practical value because it is impossible

[1] It must not be supposed, that in practice it is possible to speak with this definiteness.

to ascertain the cost of moving different commodities. In answer to this contention I would say while it is freely admitted that it is impossible to accurately ascertain what it costs to render any particular service yet in most cases it is possible to estimate approximately what is the relative cost of transporting different commodities.[1] At least with accuracy enough to promote greatly the effective use of railways. This contention Professor Adams has, at least in a measure, admitted.

The ground upon which I differ from Professor Adams is also in part the ground upon which I differ from Mr. Cowles. In his *General Freight and Passenger Post* Mr. Cowles contends that distance should be disregarded in fixing freight and passenger rates. In my opinion it should not be, for if it were the railroads would not be used most effectively. My assertion is based upon the ground that while we may not be able to tell exactly how much more it costs to haul a ton of freight 110 miles than it does to haul it 100 miles yet we do know that under exactly similar conditions it costs some more, and that under the same conditions it costs much more to haul a ton of coal 1000 miles than 100 miles and that, therefore, a system of rates which makes it indifferent to a shipper whether he sends his products 100 or 1000 miles does not result in the greatest good to society.

It is one thing to enunciate a general principle, but it is quite another matter to apply this principle. Professor Adams declares that railway rates should conform to the principle of public utility, but makes no attempt to classify according to this principle even the most important of the many commodities carried by the railways. In one place he states that the practical effect of the adoption of his principle would be "to force the mail compensation *rather* low,"[2] and in another place he asserts with certain provisos that "the application of the principle of public utility . . . . justifies an *unusually low* rate on mail transportation."[3] And in still another place he declares that "of all things transported by rail, intelligence is the most essential to social and economic advantage, and therefore is in the highest degree amenable to the consideration of public utility."[4] This contention is

[1] I do not, however, hold that it is possible to estimate the cost of performing different services with sufficient accuracy to base a theory of rates on the cost of service even assuming that it is desirable to do this.

[2] *Testimony*, etc., *1899*, p. 10.

[3] *Ibid.*, p. 11. The italics are in both cases mine.

[4] *Ibid.*, p. 10.

a debatable one. First of all come the physiological wants of man, that is, his necessities as an animal. Food, raiment, and shelter, man must have. I am therefore inclined to rank freedom of personal movement higher than I am the rapid diffusion of intelligence, for the former, it seems to me, promotes the acquisition of these things more than the latter does. For instance, the ability to move from the unproductive lands of New England to the fertile lands of the central West has resulted in greater economic and social advantage to the country than any quantity of literature circulated in New England on the subject of improved farming could have brought about.

A full discussion of the construction of a schedule, based on the principle of public utility, will not be attempted here. But before leaving this point I would like to raise the question as to whether or not the thoroughgoing application of the principle of public utility to rate making would radically change existing railway tariffs. Very likely the framers of such a schedule of railway rates would quickly meet the difficulties encountered by legislators in drawing up tariff bills. They would probably early discover that in order to raise sufficient revenue to sustain the railways it would be necessary to rely very largely upon the commodities which are essential to social and economic well-being, just as legislators have found that if sufficient revenue is to be raised, the necessities of life must be the main reliance of governments. Just how much the public would profit by the systematic application of Professor Adams's third fundamental principle of rate making, can be estimated only after the most painstaking and exhaustive study of existing rate schedules, and such an examination has not yet been made.

Perhaps the application of the principle of public utility would not greatly alter existing railway tariffs, for another reason. The better class of railway managers now fully realize that their welfare is dependent upon that of the people whom they serve, and it may be that an examination of railway schedules would show that railway men in adjusting their rates have been guided, in some measure at least, by this principle. That such is the case is admitted by Professor Adams. Brick, stone, lumber, coal, coke, ores of the base metals, and food products consumed by the masses are carried at low rates. Luxuries, on the other hand, pay high rates. In other words, the articles consumed productively are favored by railway managers, while those consumed unproductively are discriminated against. This is in consonance with Professor Adams's principle of public utility.

Although the principle of public utility is applied to the movement of freight, it is applied much more thoroughly to the transportation of passengers. As rates are now adjusted very few railroads in the United States obtain any net returns from their passenger train service, and the great bulk of the railways would probably be better off if they altogether removed their passenger trains, provided their freight train earnings were not affected. During the year 1898 the average revenue per train mile earned by the passenger trains of the United States was $.974, while the average revenue per train mile earned by the freight trains was $1.731, and the average cost of running all trains per mile was $.956.[1] While the cost of running freight and passenger trains, respectively, cannot be ascertained with exactness, it is generally estimated that it costs as much per mile to run passenger as freight trains. If this is true passenger trains contribute almost nothing to the fund for the payment of interest on bonds and dividends to stockholders.[2] As the passenger train mileage of all our railways does not fall far short of that of freight trains[3] it is seen that the principle of public utility has already been widely applied in fixing railway charges. This follows because those services which in the largest measure promote social well-being, namely, the transportation of passengers and mail, are performed by the railways at less than cost. I say less than cost, because the passenger trains contribute almost nothing to the payment of interest and dividends.

It being granted that the movement of passengers and mail is the most important of the services rendered society by the railways, and as it must be conceded that they are carried at less than cost, Professor Adams must admit that the principle of public utility is now applied to railway charges. And consequently all that remains for discussion is the question whether or not the principle is applied with sufficient thoroughness. According to the limitations he has himself placed upon the application of his principle the limit has been passed, for he says the practical effect of the adoption of the principle of public utility would be that

[1] *Statistics of the Railways of the United States, 1898*, p. 93.

[2] The statement just made of the average cost of running trains does not include these items. It is thus misleading.

[3] During the year 1898 the aggregate passenger train mileage was 341,526,769, and the aggregate freight train mileage 503,766,258. *Ibid.*, p. 69.

We have a right — the government has a right — to force the mail compensation rather low, provided it does not force it so low that the question of compensation ceases to be a question of compensation and becomes a question of taxation, and the most that statistics can do in this matter is to set up the broad mark between these two lines.[1]

If it be granted that passenger train earnings should not be forced still lower than they are now, all that remains for discussion is the proportion in which the traffic moved on passenger trains should be made to contribute to the support of the passenger train service.

If the diffusion of intelligence and the movement of passengers are of about equal social importance, then, according to the principle of public utility, they should contribute in a like ratio to the maintenance of the passenger train service. If mail and passenger earnings do conform to this standard, then the present mail rates, whose fairness it is our object to test, do satisfy the requirements of reasonableness set up by the principle of public utility. How can it be ascertained whether this conformity exists? A comparison on the basis of weight is unsatisfactory, because (1) the weight of the passengers would have to be estimated and because (2) the dead weight hauled, that is, the weight of the cars cannot be assumed to be in proportion to the weight of the mail and passengers. The space basis cannot be accepted for the second of the reasons just stated. While being far from entirely satisfactory, probably a comparison based on the gross tonnage would come the nearest to satisfying all the requirements of a fair test. By gross tonnage I mean the weight of the car plus its contents, whatever they may be. Several of the witnesses who appeared before the commission submitted arguments based on this comparison. Their results may be found in brief compass in the subjoined table:

Year ending	System	Mail Pay per mile per gross ton	Passengers Pay per mile per gross ton
		Cents	Cents
June 30, 1897 - -	Louisville and Nashville[2]	0.610	0.685
June 30, 1898 - -	Southern Railway[3]	0.745	0.581
June 30, 1897 - -	All the railways of the United States[4]	0.632	0.700

[1] *Testimony*, etc., *1899*, p. 10.

[2] *Senate Report No. 991*, p. 65, LV Congress, second session.

[3] *Testimony*, etc., *1898*, p. 942.

[4] *Testimony*, etc., *1899*, pp. 88, 89.

If the figures presented in this table are reliable it would have to be conceded that, on the basis we have accepted, the railways are not overpaid for carrying the mail. Mr. Stuart R. Knott, who presented the argument of the Louisville and Nashville Railroad Company, did not state how he obtained the gross tonnage hauled one mile. At another point in his argument he states that "the sixty-foot railway post-office cars, constructed in accordance with government requirements, weigh 89,000 pounds."[1] This may be true, but if he assumes that the average weight of the entire equipment of postal cars of the company he represented was 89,000 pounds, I should feel that he overstates the number of gross tons hauled one mile in the transportation of mail, for the old railway post-office cars do not weigh so much as the new ones. In fairness to the other railways of the United States it must be stated that conditions on the Southern railway are not typical. It is one of the very few systems of the country that receive the so-called special facility pay, and the mail for a very large portion of the South is concentrated on this line, as it has the only fast mail service in the South. Several postmasters-general in succession have refused to recommend this subsidy in their annual estimates, but one Congress after another has continued it by special appropriation. The average earnings per gross ton per mile for all the railways of the United States were taken from the second statement submitted to the postal commission by Mr. Julius Kruttschnitt, general manager of the Southern Pacific Company. His results cannot be accepted as conclusive, for they are in a measure based on estimates. It would have been much more satisfactory to have had from Mr. Kruttschnitt carefully compiled data for the Southern Pacific Company.

In view of the difficulties inherent in obtaining the gross ton mileage moved respectively in the mail and passenger business, I have been inclined to turn to car-mile and train-mile earnings for light on the reasonableness of the mail compensation. While these bases do not yield results that are wholly satisfactory, nevertheless, as railway records are now kept, they give better results than the method just presented.

In the following table the average earnings from mail and passengers per car per mile are submitted:

[1] *Senate Report No. 991*, p. 73, LV Congress, second session.

Year ending	System	Average earnings per mile of 60-foot mail cars	Average earnings per mile of all passenger cars
		Cents	Cents
June 30, 1897	Chicago and North-Western[1]	21.66	21.83
June 30, 1897	Louisville and Nashville[2]	18.79	20.06

The data for the North-Western, I have been assured, were very carefully collected. The total mileage of the mail cars could be ascertained with absolute accuracy, also the mileage of the apartment cars. As the length of the mail cars and the apartments devoted to mail were known, it was a mere matter of arithmetic to find out the equivalent mileage in terms of 60-foot cars. The space allotted to pouches had to be, in fact, estimated, but not in all cases, for on some of the through trains a fixed space is set apart for mail. No great error could be introduced because of the space assigned to pouches, for this space, reduced to car miles, amounted to but 5 per cent. of the total. It does not seem possible because the space allotted to pouches was estimated, an error was introduced into the table of 2 per cent. at the outside. The average car-mile earnings of the passenger cars has been recorded for some years, so there is probably no error at all in the statement of the earnings of the passenger equipment.

Unusual value attaches to this comparison of the mail and passenger earnings of the North-Western, because it is a large system, and has both light and heavy mail routes. That its mail earnings are typical is shown by the fact that while its average earnings per ton per mile for carrying the mail during 1897 were 12.68 cents, the average earnings for the whole country were 12.56 cents.[3] The passenger earnings of this company are also fairly representative. During 1897 the average per mile earnings of passenger trains on the North-Western were 85.9 cents, and the average per mile earnings for the whole

[1] Computed from information given on pages 444 and 449 of *Testimony*, etc., *1898*, and on pages 34 and 57 of the *Annual Report of the North-Western Railway for 1897*.

[2] *Senate Report No. 991*, p. 64, LV Congress, second session.

[3] For the average ton-mile earnings of the North-Western, see *Testimony taken by the Joint Congressional Commission on Postal Affairs in the Summer and Autumn of 1898*, p. 449, and for the average earnings of all the railways, see *Testimony*, etc., *1899*, p. 45.

country were 93.9 cents.[1] It is to be noted that the average length of the passenger cars is not stated, but I believe it may be assumed that it is less, rather than more, than 60 feet. While the sleepers exceed 60 feet in length, the standard coaches of this company are but 54 feet in length, and the aggregate mileage of the latter is several times that of the former. In the matter of dead weight the mail cars also stand about midway between the coaches and sleepers, and therefore the dead weight of the equipment hauled in transporting mail and passengers can probably also be disregarded without fear of greatly impairing the accuracy of the results.

As Mr. Knott did not state fully how the average car-mile earnings of the Louisville and Nashville were obtained, judgment as to their reliability cannot be passed. But it is due to Mr. Knott to state that no criticism can be made of his methods so far as they are set forth in his argument. The possibility of introducing a small error into the car-mile earnings of mail he has avoided by allowing no space whatever for the carriage of mail in baggage cars in closed pouches. This space would of necessity have tq be largely estimated. It is to be noted that he does not give the average length of the mail cars. It may be that the average length of the mail cars on the Louisville and Nashville is not equal to the average length of the baggage cars, coaches, diners and sleepers. On this point, however, I have no information.

Comparisons have now been made of mail and passenger earnings on the basis of the gross tonnage hauled in moving mail and passengers respectively and also on the basis of car-mile earnings. There is still one other comparison which I wish to introduce. Although it is of limited scope, it is nevertheless of great importance. It clearly shows (1) that there is still competition between railways, and (2) that although railways fiercely compete for the mail traffic, it does not follow, as has often been argued, that this business is profitable. As is well known the Burlington and the North-Western run fast-mail trains between Chicago and Council Bluffs. The Burlington carries the overland mail and has two fast-mail trains west bound and one east bound. As the Chicago-Council Bluffs route is the heaviest route this company has it would naturally be expected that these trains would yield a large revenue. The average train-mile earnings of these

[1] *Statistics of the Railways of the United States, 1897*, pp. 82 and 358.

mail trains and the average train-mile earnings of all the passenger trains of this system are set forth in the following table :[1]

Mail trains			Passenger trains
Designation of train.	System	Average earnings per train mile	Average earnings per train mile of all passenger trains
No. 15, west bound No. 7, west bound No. 8, east bound	Chicago, Burlington and Quincy Railroad Company	$1.33 .82 .61	$1.09

After the presentation of this table it scarcely needs to be said that the fast-mail trains of this system between Chicago and Council Bluffs cannot be a source of profit. The average speed of the fastest of these trains is higher than that of any other fast-mail train carrying transcontinental mail. The fast-mail trains between New York and Chicago, and Council Bluffs and San Francisco are slow trains compared with the trains of the Burlington.

V.

The fourth and last of Professor Adams's fundamental principles in accordance with which railroad rates should be adjusted reads as follows :

> The possibility of introducing economies into the business of transportation depends upon the increase in the volume of traffic, from which, in the absence of countervailing considerations, it follows that a form of traffic which increases most rapidly through a series of years should show a relatively more rapid decrease in changes [charges] as compared with other traffic.[2]

It will be remembered that before Professor Adams presented his fundamental principles of rate-making he took the ground that the reasonableness of a rate could not be judged from the cost of service because it is impossible to ascertain the cost service. He also assumed, in substance at least, that even if it were possible to compute the cost of service it would not be advantageous to the public

[1] The data from which the train-mile earnings of the mail trains were computed were obtained from Mr. E. L. West, superintendent of railway mail service. The earnings of passenger trains on the Burlington were obtained from the auditor of the Burlington, Mr. C. I. Sturgis. In train number 7, except on Tuesdays, there is an express car from Chicago to Union Pacific Transfer. Some of the mail cars hauled west loaded are returned empty.

[2] *Testimony*, etc., *1899*, pp. 11 and 12.

to adjust rates on that basis. In other words, that the interests of the public would be best advanced by encouraging with low rates the movement of those commodities which in the largest measure promote social welfare and by discouraging by high rates the movement of such articles as are either of little value or are positively inimical to the interests of society. As I have before stated, Professor Adams has not presented his views perhaps as explicitly as they have just been set forth, but he is logically bound by his utterances to the propositions I have stated.

Professor Adams's fourth fundamental principle is not in harmony with his other fundamental principles. It was asserted that public utility should be the fundamental consideration in rate-making. This being true, I cannot understand why, as a broad proposition, rates on any particular commodity should be lowered just because the movement of that commodity has largely increased, thereby making possible the introduction of economies into the business of transportation. On the contrary, such an increased movement might be assigned as a sufficient reason for the rate being fixed higher. Whether the rate should go up or down would depend upon whether, after all things had been considered, the enlarged movement of the article under consideration would be the best for society. Concretely stated, there are probably few persons who would contend that railway rates on whisky should be lowered simply because at the prevailing rates the movement of this liquor had largely increased, thereby permitting of the introduction of economies in its transportation. It may be said that mail does not belong in the same class with he article just mentioned. To this I should reply that the assertion s true enough, but that Professor Adams undertook to state the broad principles in harmony with which rates should be adjusted.

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THE PHILADELPHIA COMMERCIAL MUSEUM.

MERCANTILE pursuits have now attained a prestige and a relative magnitude which they scarcely ever possessed at any other period of the world's history. Evidence accumulates on all sides to show that in the future increasing power and influence are to be the prerogative of the merchant and banker. From the point of view of the history of nations, it may be said that the great community of the world's traders has become all-powerful and most influential in the furtherance of good or evil. The national fate of untold millions hangs from their mercantile adaptability, depend from their "purchasing power" and their accessibility to the barterer and trader. No longer do the nations of the world derive their antagonisms, their feuds, and their hatreds from dynastic quibbles and religious bickerings. The cudgels of the nations are now wielded because of trade privileges, commercial discrimination, and mercantile disaffection. Civilization now spreads not through the search of heathens but through the quest for buyers, and the need for the savage's wares. Diplomacy has learned to use its wiles to further the merchant's interests, and the cannon's roar but proclaims the insistance and the indignation of the traders.

It is the incentive of the merchant which brings about the best results that accrue from progress in natural science, in technology and in transportation. More than ever before the choice of the buyer is being widened, the scope of the seller extended. The local market has all but disappeared, and in its place, one big mart, that of the world has been substituted. In a constantly growing degree, the commercial enterprises of the world contribute by means of fiscal taxation to that support of the state which enables it to discharge its civilizing duties and to execute its pacificatory intentions.

With the growing importance of commerce and the sharpening of commercial competition, there has sprung up everywhere in civilized countries a greater desire for commercial knowledge and information. It is worthy of notice that the great trading nations are urging upon their governments the necessity of closer attention to commercial education, and are insisting upon the devotion of national funds to the furtherance of interest in mercantile intelligence and information. It is a matter for constant attention and frequent complaint that, whereas

it is comparatively easy to acquire knowledge in all branches of technology, industry, agriculture, and forestry, it is most difficult to acquire a satisfactory insight into the characteristics and conditions of the world's commerce and commercial resources. This lack of facilities for obtaining commercial information of a practical, scientific character is in no small degree due to the absence of recognized national institutions devoted to tuition in these special branches. And yet the education of the successful merchant and of his assistants must be of a high order, and must cover an intimate acquaintance with the world's wants, the world's products and their application. The desire to cover this want for information has found expression in the creation of Commercial Museums. These institutions bid fair to become the most valuable means of keeping pace with the freer and more active commercial movement all over the civilized world; in a word, to furnish that preparation which is considered essential in every other field of human exertion and activity.

It would take us beyond the scope of this paper to trace the history of the various commercial museums extant or to discover where and by whom the original conception of such an institution was formed. Whether in Brussels, or in London, or in Vienna is immaterial as far as we are immediately concerned. As far as this country is affected the term "Commercial Museum" is synonymous with the institution in the Quaker City. Philadelphia has once again demonstrated the injustice of casting any reflection upon her rate of progress. The term "Museum" as applied to the institution in Philadelphia is misleading. Its scope and functions extend far beyond those usually associated with museums: it might more aptly be termed a center of intelligence on all matters appertaining to international commerce. It is unnecessary to review the conditions under which this institution started or to advert to the work which it was originally intended to fulfill. Suffice it to say that the original conception — that of forming a purely instructive collection of commercial products — has long since been outgrown, and has been superseded by an idea far more grandiose and wide-reaching: the *raison d'être* of the Philadelphia Commercial Museum as it now stands is primarily the general extension of the foreign interchange and commerce of the United States.

In order that one may fully appreciate the usefulness of an institution of this kind, and especially to this country, it is necessary to place one's self in the position of the American manufacturer who, finding

himself outstripping the absorptive powers of the home market, experiences a growing difficulty in selling his wares and turns his thought to foreign fields in the hope of diminishing the ever-increasing domestic congestion. Straightway this manufacturer perceives that his untutored mind blocks the way: he has heard that wares similar to those he makes are liked abroad. He believes his own products could find favor there and yet he knows not how to market his own manufactures. He is like one in a labyrinth, confident that an exit exists but not knowing how to find it. How is a manufacturer, or for that matter, a merchant to know the conditions which exist, the laws which prevail, the customs which flourish, and the tastes which rule in the hundreds of markets the world over? Certain general conditions are well-known to him, but they only serve to strengthen in him the belief that if he were possessed of specific information he could turn it to profitable use. Where will he obtain that knowledge, where can he be told of the physical qualities which his wares must possess if they are to enter fields already occupied, countries where tastes have been formed? How can the busy manufacturer leave his plant in Connecticut or Pennsylvania to find out the prejudices, the tastes, the predilections of possible customers in the four corners of the globe? And yet, it is just this manufacturer who is by nature and by surroundings often best qualified to furnish the wants of those foreign customers, but who, owing to the very nature of the conditions under which he grew up, is less acquainted with those foreign customers than any of his possible rivals! The American manufacturer can best supply the wants of foreign markets and he is the most ignorant of all about them. For centuries the mills and workshops of Europe have been supplying the ends of the world with their output; their owners and their agents have scoured the earth for information and have created tastes for their products. Whilst the shops and factories of this country were busy keeping pace with the magnificent growth of this new country, Europe was already disposing of its surplus, and when production began to cope with the home demand the ingenuity and time of the American manufacturer were centered in filling a bigger share of his domestic demand, in pleasing a bigger community of his fellow-countrymen. In time his prolific mills and shops proved too quick for even the active demand of the consumers of this country. There came a period of idleness, followed by further periods of inactivity; the glut of commodities had been produced, the fires were put out and

the mills shut down. But it needed but a little observation to discover that periods of domestic depression were often synchronous with a strong demand for the very same goods abroad — foreign traders had snatched at the goods on his overburdened bargain-counter. The desire grew strong to sell to the foreign consumer. And with this desire there came the discovery that he was ignorant of the foreign consumer's whereabouts, tastes, and wishes. It is to furnish him with this knowledge that the Philadelphia Commercial Museum exists, and it is through this institution that he is rapidly obtaining that knowledge and experience which has been acquired by his European rival through long years of slow, plodding, expensive experiment. How did this institution come to do this work?

In the first place there was no "institution;" there was but Dr. William P. Wilson and an amanuensis. He secured the active co-operation of the late Dr. William Pepper, himself a man of remarkable endowments, to carry out those ideas of commercial enlightenment which were shared in common and the dissemination of which were to prove of such vast utility to the commercial interests of this country. The first efforts of Dr. Pepper and Dr. Wilson were directed towards obtaining local support for and stimulating local interest in the task which they had set themselves to perform. In this they were eminently successful. Their next venture was to prevent the dispersion of the collection of natural products of commercial interest which had been brought from the ends of the world to the Chicago World's Fair. They not only succeeded in this, but they also found a place for them in an immense building composed of disused offices which the Pennsylvania Railway Company generously gave for a number of years at a nominal rent. The fibers, wools, hides, gums, oils, timbers, minerals, seeds, and the rest of the products were classified scientifically, presented in monographic and geographic groups, inscribed with the basic information which could cover them in a general way, and the result was the most interesting and instructive collection of commercially useful products ever made accessible to the public. A museum of commercial products had been created. It formed the nucleus of a most remarkable growth. The exhibits awakened interest, questions began to be asked about them, and answers were given freely. The public of Philadelphia, proud of the possession of such a valuable collection, voted money for its maintenance and extension. The desire for information regarding these commercial products grew

to such extent that even the wide knowledge of its assemble could not always give the latest information which might be available concerning them. It was necessary to obtain information from abroad regarding them, and an active foreign correspondence got under way. This was supplemented by the organization of a library of commercial publications, from which many data were procured. The Philadelphia Commercial Museum began to be known in a general way as an authority on foreign products of commercial interest. Then came the stray inquiry, not regarding the natural product, but the foreign manufactured article and its disposal. The Bureau of Information had received its first inquiry and had been set in motion. Little by little, with much groping, the work of the bureau was extended. It grew so quickly that it soon surpassed in magnitude the original "Museum." It was soon found that the original conception had undergone the quantitative modifications which finally had produced a qualitative change. And the "Museum" began to work in the commercial world changes similar to those which the introduction of steam had produced in the industrial world. The merchant, and especially the manufacturer, began to hear of the institution which was specially equipped to furnish that knowledge which they in vain had sought — they had now the help of a skilled instructor. The schoolmaster had literally gone abroad for books containing any information of direct use to the exporter — for periodicals, pamphlets, consular reports, government statistics, chamber of commerce reports, and all the literary output which could be of avail in building up a knowledge of commercial matters in all countries. The commercial library of the Commercial Museum had been started. A staff of librarians and cataloguers was gradually shaping into tangible units that which had been a scattered mass of details, lost in all corners of the globe, hidden behind the intricacies of the dozen languages of international trade. Every fact worth knowing, whether now or later, was seized upon. The card-index system, with its manifold cross-references, did the rest. "Cabots" could be found under "Textiles," as well as under Turkey, subsection "Smyrna," the town importing the article. In the same way every article or paragraph appearing in any of the hundreds of publications regularly received from all parts of the globe which could possibly serve as a basis of information useful to any class of commercial men or manufacturers was recorded in the way most accessible for future reference, was made available for use on simple request and were evidence of *bona fides*.

Soon it was found that this service of commercial information was being appreciated by the various manufacturing interests of the country. It was a ready adviser on all matters appertaining to foreign trade. Where else in the United States could you learn at the shortest notice what shape of butcher's knife was preferred in Servia, or how tenpenny nails had to be wrapped up in order to suit the requirements of Beyrouth; whose brand of condensed milk was in favor in Colombo, or whose make of argicultural forks were being used in Argentina? Endless were the details which needed explanation before a manufacturer felt justified in making the expenditure incidental to initial efforts at export. Was it really true that the packing methods ordinarily used here would be useless if adopted for stoves going to Bogota? Was it a fact that cases for Buenos Ayres had to be marked on the side only, and if for Valparaiso marked with stencil only? Were musical instruments shipped to Mexico taxed at customs on the net or the gross or the legal weight? Was there any demand for oilcloth in Brazil? What would be the freight on forty brass bedsteads ordered from Rangoon? How would you write "Handle with care" in Russian? Could you do into English the annexed letter from Yokohama? What is the analysis of the coal furnished by the local mines at Cape Town? What is the freight rate on coal to that port? Was the demand in Brisbane chiefly for lubricating oils or lubricating greases?

There is no end to the catechism which was being formed by the manufacturers and shippers of this country. And to each the Commercial Museum gave its reply, and begged to "come again." In spite of the fact that the work was handicapped by lack of sufficient funds—for the city's appropriations were for the "coming fiscal year," in which time the Museum doubled its work—excellent results were being obtained. A staff of linguists and commercial experts was being brought together; agents were sent abroad to form co-operations and obtain information; foreign governments were being enrolled among the sympathizers, and chambers of commerce made active advisers in the work. Before long the Commercial Museum had grown so great, its resources and its equipment had increased so remarkably, that Dr. Wilson, the director, thought it possible to launch out more boldly. The Commercial Museum was destined to become not merely the passive, watchful servant, it was to be the alert, indefatigable adviser of the multifarious manufacturing interests of this country. It took the initiative, investigated trade conditions in all parts of the world,

noted opportunities and quickly called attention to the possibilities presented. It extended its service: for a nominal yearly payment (the cost of obtaining, ordering, and disseminating information) it began to offer to manufacturers all over the country specific detailed knowledge which was essential to the successful prosecution of an export business. The offer found a ready acceptance at the hands of the most enterprising and energetic manufacturers all over the country. This information was in the shape of an exhaustive report on the possibilities of and the method to be adopted for selling a specific article in a particular foreign market; for instance, sheep-shears in Wellington, New Zealand, or machine belting in Bombay. This report aimed to convey all necessary data under the following captions: Character and variety of the article already on the market the competition of which would have to be faced; names and addresses of the manufacturers now supplying the market, with special reference to those characteristics of their goods which had procured them favor; all available statistical information regarding the quantity imported, with reference to their countries of origin, declared values, etc.; prices of the article in question at the manufacturer's, and the terms of payment generally demanded of and granted by him; price at which the article is being sold by the importer to the consumers on the market in question; information regarding facilities of transportation and the relative shipping rates and charges between the American seaport and the market, as compared with the rates paid by rival countries; customs charges and regulations as to invoices, marking, declaration, etc.; recommendations as to wrapping, labeling, marking, and packing, as governed by climatic conditions, transportation facilities, and handling, etc.; names and addresses of the most reliable importers already trading in the article in question; the field of distribution controlled by the market under review; any useful supplementary information not included in any of the foregoing. It will be conceded that any manufacturer or shipper who was armed with the information given in such a regular monthly report was acquiring a fund of information which would be of great benefit in enabling him to embark upon a venture entirely new to him.

When the information given out by the Commercial Museum began to be acted upon, its sphere of utility was immediately greatly extended. For the American houses, in communicating with foreign merchants not infrequently mentioned that their efforts had been

directed by the Philadelphia Commercial Museum. The fame of this institution abroad was considerably magnified, especially when it became more generally known that the Museum was willing to give, free of charge, any desired information concerning the resources or industries of the United States. Here again this country's trade was benefited. Endless in number and variety were the enquiries which began to pour in on the Museum. Now it was a copy of a trade-mark which reached the Museum, with the request that the name of its owner should be given, thus inaugurating direct trade relationship instead of Hamburg or Liverpool mediation. Most frequently the names of manufacturers of certain specified articles were desired, generally coupled with the request that they should be asked to communicate with the enquirer. Not infrequently orders, or specifications of requirements were received, with the request that they be placed in the hands of suitable parties.

Soon after the Museum had become assured of the willingness and the strong desire to reciprocate kindnesses which animated its many correspondents abroad, the idea was conceived of organizing a systematic plan for the investigation of the moral and commercial reputation of the merchants all over the world who were actual or prospective correspondents of American houses. It was obvious that American manufacturers should be furnished reliable statements regarding not only the goods which could be disposed of in various parts of the world, but also concerning the houses to whom these articles might be offered without risk. This work was inaugurated and is still being vigorously pushed on. Results prove that the hopes which were entertained at the inception of the work were not delusive. Rapidly, yet surely and accurately, a mass of information has been obtained. It aims to cover as completely as possible the following particulars concerning a firm: exact style and address, specific list of articles imported and exported, telegraphic address and names of the cable codes used. This much had been generally obtained without difficulty from friendly correspondents in all regions. The information was corrected and supplemented, on direct request, by the persons interested. It is quite exceptional to meet with any refusal to supply this information, especially as after a lapse of time an unanswered first request is followed by a second and, if need be, a third. After knowing exactly the *nature* of a business conducted by a house, it became desirable to know more concerning the methods and principles by which the conduct

of the business was governed, as well as the pecuniary conditions of the house. Here it was that the Museum found cause to congratulate itself on its extensive connections and its warm friendship with the great banking institutions all over the world. It needed but the assurance that the information would be treated with all discretion and in perfect confidence. The banks were sensible and quick enough to perceive the advantage to themselves which would result from the introduction of American exporters only to such houses as were morally and financially sound. They gave what information they had to the Museum — moral reputation, business peculiarities, financial status. As this confidential matter pours into the Museum it is being recorded, checked, controlled, kept fresh by constant revision and corroborative testimony. As occasion arises, the moral or financial blacksheep, the defaulters, the bankrupts, the "lame ducks," are quickly made known to all who might come in contact with them in the United States. The result is a reduction to a minimum of connections which might otherwise prove unsatisfactory. There is not a "shaky" house in Amsterdam or Smyrna or Bangkok from whom, at some time or other, the Museum has not saved some intended victim of a plausible letter written under a meretricious letter head.

Acting upon its primary principle of never waiting till its wares are stale before serving them up, the Museum has always put this information to use while it was fresh and "piping hot." The following true copy of a statement sent out conveys a good idea of the form and substance of the information given:

A. S. PATRIKIOS & CO.,
Constantinople,
Turkey-in-Europe.

Established in 1847.

Telegraphic address "Patrikios." Codes: A1, ABC 4th edition.

Branches at Ismid and Galata.

Bankers, commission merchants and real estate brokers. Importers: agricultural machinery, steam engines, cereals, flour, etc. Exporters: cereals, raw silk, silk cocoons, etc. Proprietors of steam mills.

Representatives at Ismid for the "Banque Imperial Ottomane," Constantinople, Turkey-in-Europe.

Property of the Philadelphia Commercial Museum.

E 2558

It will be seen that Messrs. A. S. Patrikios & Co. import agricultural machinery, steam engines, cereals, flour, etc. Every United States manufacturer who has informed the Museum that he is desirous of establishing foreign connections, who manufactures agricultural machinery, steam engines, etc., will receive at frequent intervals such cards as the above, giving particulars of the business conducted by a possible customer. The circulation of the information is a guarantee of the reliability of the firm therein described. It will be readily understood that with such information in hand, there is no reasonable excuse why overtures should not be made to the foreign house, and why these should not lead to the acquisition of a share of that firm's business. As a matter of fact, this special service of the Museum has borne excellent fruit. After all, half the trouble of selling is over when once you know for certain on whom you may concentrate your efforts, whom you must avoid, in whom you may place confidence and from whom you must exact "cash against Bills of Lading."

It will be seen, then, that the Museum's work has been manifold in character yet with a single end. The American manufacturer has been told in a precise, specific way where he may sell his wares, to whom he may sell them, how he can best realize his intentions. It is evident that the amount of work involved is something enormous. Letters in a dozen languages have to be deciphered, and typewritten answers written, a thousand periodicals have to be searched and the information obtained indexed and cross-indexed; thousands of foreign houses must be investigated and reported upon. All this takes time, money, hard work, and executive ability.

And no sooner does the performance of one branch of work seem to have approached that smoothness and clearness of execution which stamps it as humanly perfect, than a new field for ingenuity, a new factor in furthering international trade interests is discovered and brought into play. It goes through the evolutionary process which has characterized all phases of development in the Museum's work. The idea is applied, the first tentative efforts are made, faults are discovered, remedies introduced, the drawbacks eliminated, improvements made until the crude idea finally finds expression in another perfect wheel in the great mechanism of foreign trade intelligence. Two of these latest additions to the Museum's efforts may be instanced: the "rush-news" service and the "photographic information." The former consists in making immediately available for use any paragraph of news

which may come in with the mail from a certain part of the world. For instance, the Australian mail has just brought the papers from the Antipodes. The newspapers are searched, and all items which call for prompt attention are immediately dealt with by a corps of experts devoted to that special work, supplemented in their efforts by others of the foreign staff. It may be a specification of government supplies for which tenders must be delivered by a certain date; it may be the decision of a deliberative body to sanction the building of a certain railway, the construction of an acqueduct, the dredging of a harbor; or it may be the announcement of the heavy defalcations of the treasurer of an important bank. As quickly as can be, the news is spread and the exporters are made aware of that which interests them. If an appropriation has been made for railway extension or for the improvement of equipment, the news goes to the maker of locomotives, of rails, of steam fittings; in short, to everyone who is directly interested. Sometimes the news has just been received direct from the agent on the spot: more frequently the Museum is ahead of him, but generally it compensates for his unpardonable omissions to report.

The need of the photographic service became obvious on the day when it was found that there were limits to the Museum's descriptive powers. However well a machine or the special function demanded of it might be portrayed in words, there was often something lacking about the description which needed to be supplied. The camera came to the rescue; so that now there is no doubt left as to the exact character of a plow used in a particular country. The Museum's agent sends a picture of the article most in demand—the fancy articles and the staple goods. The reproduction of the picture, the emphasizing of detail, in fact, all the rest is done in the studios of the Museum under the care of an expert photographer. And even were no picture of an imported article can be obtained, the work it has to perform can be pictured so that the manufacturer knows exactly what is expected of him. A glance at the paddy fields of the Mekong Valley before the floods and during the floods, for instance, is sufficient to show that only a special form of plow can be used on these rice fields.

The most exact of sciences, chemistry, has been brought to the assistance of the Museum. Its magnificently equipped and intelligently conducted laboratories have already rendered invaluable service to the American manufacturer desirous of knowing the secrets of his foreign rival's wares: the percentage of cotton in the "pure linen"

goods, of maize in the "wheaten flour," of shrinkage in manufacturing. Still more useful have been the verdicts pronounced by it concerning the properties and values of natural products sent from all parts of the globe. How much money has not been saved by the statements that certain "immense silver deposits" contained nothing more valuable than iron pyrites; that certain gums were useless for the manufacture of varnish; that certain caoutchouc contained so much water? If the work done by the laboratories of the Commercial Museum had not been immediately productive of such big results as have followed on the efforts of its less "scientific" departments, it is a source of consolation to know that what it has done has been admirably done, and that, at any moment it may accomplish that for which the world could never cease to be indebted and grateful.

W. COLGROVE BETTS.

PHILADELPHIA.

NOTES.

PROFESSOR DUNBAR.

CHARLES FRANKLIN DUNBAR, professor of political economy in Harvard University, died in his seventieth year, on January 29, 1900. It is with a sinking heart that we chronicle the passing of another of the first economists of our country. Born at Abington, Massachusetts, July 28, 1831, he spent his life in that state, varied by a short stay in Louisana during the Civil War. In 1851 he was graduated at Harvard, where he was conspicuous for his accurate literary style; he studied law for a time in the Harvard Law School; then lived in the country at Lexington, Mass., for some years, writing more or less for Boston newspapers. In 1859 he became assistant editor, and in 1864 editor in chief, of the Boston *Daily Advertiser*, making it in a short time a power of the first importance. Probably no editorials written during that period of our history showed anything like the insight and grasp of the facts and principles relating to our financial policy which were displayed in those of Mr. Dunbar. The *Advertiser* became easily the first newspaper in New England, and its editor became known as a writer of unusual attainments and a man of exceptional force and ability.

Harvard University at that time had no professorship of political economy, the subject being taught by the professor of philosophy, Francis Bowen. One of the first results of the policy of Charles W. Eliot, chosen president of Harvard in 1869, was the appointment of Mr. Dunbar to a chair of political economy in 1871, which he held to the time of his death. His incumbency, therefore, covers the interesting period of the development of economic instruction in the United States from small beginnings to a symmetrically arranged curriculum. Professor Dunbar's discretion and sound judgment led to his being chosen as Dean of the Faculty (in succession to Professor E. W. Gurney) from 1876 to 1882. In addition to his teaching, and in spite of a weak constitution and frail health, he successfully performed his administrative tasks, though at a great loss to economics during what should have been most productive years. In 1891 Harvard University gave him the degree of LL.D., a distinction rarely offered to those still in the active service of the institution.

By temperament Professor Dunbar was not disposed to rapid production. His accuracy as to facts, his exactness of expression, his contained brevity, his caution made writing a slow process; but what he did publish was characterized by a singular efficiency, force, logic, and literary finish. His treatment was exhaustive and convincing; the depth of his scholarship and a constitutional aversion to inaccuracy made impossible even minor blemishes in his work. The following books form his best known contributions to economics:

Laws of the United States relating to Currency, Finance, and Banking from 1789 to 1891. Boston: Ginn & Co., 1891. 8vo. pp. 309.

Chapters on the Theory and History of Banking. New York: Putnam's Sons, 1891. 12mo. pp. vi + 199. [First privately printed, Cambridge, 1885, without the chapters on "Combined Reserves," and "Bank of Amsterdam."]

His most characteristic work, however, is to be found in the following articles:

"Economic Science in America, 1776–1876," *North American Review*, January 1876.

"The Reaction in Political Economy," *Quarterly Journal of Economy*, October 1896.

"Deposits as Currency," *ibid.*, July 1887.

"The Direct Tax," *ibid.*, July 1889.

"The Academic Study of Political Economy," *ibid.*, July 1891.

"The Bank of Venice," *ibid.*, April 1892.

"The Bank Note Question," *ibid.*, October 1892.

"The New Income Tax," *ibid.*, October 1894.

"Safety of the Legal Tender Paper," *ibid.*, April 1897.

"The National Bank System," *ibid.*, October 1897.

"Can We Keep a Gold Currency?" *ibid.*, April 1899.

His history of economics in this country from 1776 to 1876 is so judicial, so just, so comprehensive that it must always stand as the best introduction to any historical treatment of our science in America. It is a model of its kind.

Professor Dunbar was so little known to the general public, by reason of his modesty and lack of advertising skill, that his services to the cause of sound monetary education may easily be underrated. Public addresses he never gave; but through his teaching and writing on money and taxation he undoubtedly changed the currents of thinking among leaders of opinion. Receiving from the erratic McLeod a

most valuable suggestion of the identity existing between bank issues and deposits in their service to a bank, he gave it such cogent and lucid exposition that it may now be regarded as a part of our general stock of beliefs, thereby having no small influence on the thinking of the day. His article on "Deposits as Currency" cannot possibly be overestimated as a clear and practical exposition of monetary operations generally overlooked by the business world, especially as they concern the elasticity of our currency. It is to be hoped that his death will not prevent the carrying out of his plan to issue a new volume dealing with existing currency problems. In a letter to the writer during the sessions of the Monetary Commission (December 5, 1897) he said: "With reference to the suggestion in your letter about another article, the two which I have written (Greenbacks and National Banking) were part of a scheme, and to be followed by a third, much on the line which you mention." This third article was the one on a Gold Currency published in 1899—the last of his work. These studies (including "Deposits as Currency") should be reprinted in book form so that they may be accessible to the general public. They are the best writing of any American economist on the problems still before us for settlement. When one realizes how much influence Professor Dunbar might have had upon public opinion by such work as this, one almost begrudges to Harvard University the time and strength he gave to her administrative work, and even to the preparation of his really valuable volume of Laws, which might have been done by a mind far less fit than his for original and wise handling of great public questions.

It should not be forgotten, also, how much valuable historical material on the finances of the Civil War is buried in the files of the Boston *Advertiser* in Professor Dunbar's editorials. A great service could be rendered by the publication under competent editorship of these valuable papers.

Doubtless, as he himself would have said, his greatest service to political economy was not performed by his writing, but by his work in the class room and his organization of economic teaching at Harvard; for his was a pioneer's task, at a period soon after the Civil War, when the minds of the community were turned to the solution of new economic problems, for which university instruction had hitherto given little help.

The controlling principle which guided him in the development of the courses, as well as in the conduct of the *Quarterly Journal of Economics* founded in 1886, cannot be better stated than in his words characterizing political economy: "Broad as are its applications in the actual affairs of life, it is mastered and fruitfully studied best as an abstract inquiry. . . . Hence, . . . the impossibility of stating the application of any scientific law under special conditions, until the nature of the law has first been thoroughly investigated, abstraction being made of all accidents of time, place, or disturbing influences (*North American Review*, 1876, p. 146). Before the history, should come a grasp of the principles whose history was desired; before the practical applications, should come a process by which the economic laws were thoroughly assimilated. Remembering that the first extension of economic courses took place in these years at Harvard, and that students went from there to other institutions, it is not too much to say that there is no department of political economy in the country today which has been unaffected by this policy, in spite of the effort to approach the subject first by courses dealing with the descriptive material and the history of doctrine. Hence Professor Dunbar, through his insight, judgment and analytic quality, has had more influence upon the teaching of political economy in America than can be assigned to any other man. Perhaps this conclusion would have been to him the most satisfying encomium which could be pronounced upon him. The somewhat Ricardian quotation above given should not be misinterpreted: it is not a declaration for theoretical treatment *per se*; for no one was more fitted by nature and by experience than he for the testing of theory by facts. His conception of the best methods of adjusting the courses of instruction so as to produce the best economist was not infrequently misunderstood by the callow, or superficial student; it often required a year or so of faith before the worker learned enough to see the value of the disciplinary methods. Professor Dunbar was concerned more with giving men mental grasp and power to think in the subject than with giving them useful information—great as is that temptation in so practical a subject as economics. Also, as editor of the journal he was most interested in stimulating the discussion of principles and theory which would lead to additions to the science, knowing full well that the eager pressure for practical results would bring forth enough useful and timely material.

In view of this attitude toward his subject, it is well to remember that his actual achievements were all in the field of practical economics, thus keeping that poise between logical reasoning and concrete experience which was so marked in Adam Smith and Bagehot. But his mind kept a firm and steady grasp upon the theoretical discussions, no matter how far they wandered into ethical or political complications. This quality appears at its best in "The Reaction in Political Economy," written as a declaration of the editor in the first number of the *Quarterly Journal of Economics*. By showing that the reaction was largely due to the stoppage of scientific inquiry by the failure to extend discussion to the fresh experience of recent times, he made it evident that the differences of opinion as to method were mainly differences in degree, and aided in bringing about in America the present freedom from dispute on this matter. Likewise, by pointing out that the most rigid Ricardian may reject or accept *laissez faire*, without doing violence to his standing as a member of the so-called old school, he explained that it had nothing to do with economic reasoning itself, that it concerned only the applications of such reasoning. His position, then, among modern economists was clearly that of a consistent, broad, philosophical student closely interested in practical problems; too learned to be an extremist; too exact to be visionary; too penetrating to be carried away by any passing fads.

Possessing a frail body, a weak voice, an impersonal manner, and no great magnetism as a teacher, yet no one of Professor Dunbar's friends will ever forget his strong, refined face, his penetrating eye, his self-possession, his deliberation of perfectly-adjusted speech, his keenness, his flashes of humor, his knowledge of human nature, his practical common sense, and his political sagacity. His students everywhere throughout the land will unite in doing honor to his memory.

J. Laurence Laughlin.

DR. MacFARLANE ON "COMPLEMENTARY GOODS."[1]

In Part I of his recently published book Dr. MacFarlane has developed numerous original, and sometimes erroneous concepts. He argues, for instance, that if the Austrians had considered the case of the good made to order, they would have been led to modify their theory at the point where it eliminates the sellers' valuations;[2] though it need

[1] *Value and Distribution*. Philadelphia: Lippincott & Co., 1899.

[2] P. 46.

scarcely be pointed out that the price of the good made to order is conspicuously a price with which the seller's valuation has nothing whatever to do. And again, he contends that the Austrians, in arguing that buyers' valuations will range themselves in a nicely graduated differential series, have based their theory on an "unwarranted assumption of free competition."[1] Clearly Dr. MacFarlane must have a novel understanding of the term free competition. In their ordinary use the words connote, I think, the non-existence of advantage on the part of any of the competitors; as applied to buyers they necessarily mean that the buyers are equally capable, or that each places on the good in question precisely the same money valuation. And in this, the ordinary sense of the term, free competition is manifestly incompatible with valuations ranged in differential series; for, however slight the differences by which the series is graduated, buyer Z will nevertheless be at a decided disadvantage in competing with buyer A.

But passing over minor fallacies such as these, I wish briefly to indicate the more fundamental of the several errors contained in Dr. MacFarlane's section on Complementary Goods.[2]

> In parting with a complementary good we lose not only the pleasure that would result from the direct consumption of that single commodity, but also an additional pleasure due to the importance of this single good to the complementary group of which it forms an essential part. In other words, a single commodity when it becomes a part of such a group, has, as it were, two marginal utilities or values. This raises the question, "Which of these, or what combination of these, determines the price of the productive good?" . . . . Here, as in every instance of scarcity price, the marginal utility of the good to the buyer and its marginal utility to the seller fix the upper and lower limits of the price. The precise point at which the price will be fixed depends upon the relative monopoly strength of the parties to the transaction.

Now it must be objected in the first place that a commodity can have a real utility only to the person who actually possesses and uses it, and that it is therefore meaningless to speak of a commodity as having two marginal utilities. The question becomes intelligible only when we understand that "marginal utility" is Dr. MacFarlane's way of saying "subjective valuation." Moreover, in parting with a complementary good we do *not* lose the "pleasure that would result from the direct consumption of the commodity," for the simple reason that

[1] P. 48.

[2] P. 60.

complementary goods — land, labor, machines, etc. — are, generally speaking, not directly consumable. If, then, complementary goods yield only indirect utilities, it follows that such goods cannot possess a marginal utility to the seller, in Dr. MacFarlane's sense of the term. In a word, his lower limit to the price of a productive good is purely imaginary.

Facts, patent to be sure, yet very much to the point for the handling of the problem in question, are these: that although the ordinary productive good cannot be directly consumed, it can nevertheless be turned to a variety of uses; in whichever of its several possible uses the good is consumed it will yield a value; and accordingly, therefore, as they can turn it to one use or to another, different entrepreneurs will value the good at quite different figures. If Dr. MacFarlane had taken these facts into consideration, his theory of price must, I think, have issued essentially as follows: In such a market as the economist usually takes for granted, the productive good will go to that entrepreneur who can make it yield the greatest utility, and who, accordingly, puts on the good the highest valuation. His money valuation, or the utmost he is willing to give for the good rather than go without it, is the upper limit of the price. The next highest valuation put upon the good will be the lower limit of the price. And as between these limits — provided the difference is appreciable — the precise point at which the good sells will, in fact, be determined by the "relative monopoly strength of the parties to the transaction."

It is to be added, however, that this obvious bit of reasoning by no means sounds the depths of the difficulties presented by complementary goods; but that, quite to the contrary, it leads directly to a problem the acquaintance of which Dr. MacFarlane apparently has yet to make. If the price of a productive good is determined between two valuations, the question arises, on what grounds are these valuations made? The answer, of course, is that the entrepreneur must always base his valuations on his own or somebody else's experience. Some such complementary group as he has it in mind to form, has been made to turn out consumable commodities before; and the value which the finished commodities brought in the market has been divided up and a portion of it ascribed to each factor of the group. But this only raises the further question: How are these shares assigned, or according to what principles can we impute to a

complementary good its peculiar contribution to the value of the joint product?

Now it is from the heart of Wieser's discussion of this second problem of "complementariness" that Dr. MacFarlane draws the following quotation: "The imputation of the productive contribution assigns in this way to every productive good a *medium share*. To calculate the productive contribution, and therefore also the value, at this medium amount is sound common sense."[1] And this quotation, Dr. MacFarlane would have us believe, is a direct answer to that question of his which asks which of the "two marginal utilities" of a complementary good determines its price. "When the Austrians came to the question of complementary goods," he says, "they thought they had found an exceptional complication, for it was clear that in this case the marginal utility to buyer and seller only set limits within which the price may vary. And so, without further analysis, we are told that the price is fixed at a middle point between these limits, or that it is a 'medium amount.'"[2]

Now I am inclined to think that, even in the light of the above scanty introduction to the problem of imputation, the utter inapplicability of Wieser's words to Dr. MacFarlane's question will appear at once. In the first place, to characterize the "productive contribution and therefore also the value" of a complementary good as a "medium amount" is to say nothing of price. For the value referred to is not exchange value but the "natural" "use" or "theoretical" value which is virtually identical with the "productive contribution" or "economical share." And, secondly, it needs only a glance at the context from which the passage is taken to show that Wieser's "medium share" is not medium between Dr. MacFarlane's "two marginal utilities." Wieser has just stated that to a complementary good must be imputed a *greater* value than it could obtain through its own powers working alone; but a *lesser* value than would be lost if the good were destroyed. And it is between these greater and lesser values—values which have been ascribed to complementary goods by fallacious principles of imputation—that the share imputed by Wieser's rule is said to be a "medium amount."

ALFRED L. FISH.

[1] *Natural Value*, p. 92.

[2] *Value and Distribution*, p. 60.

THE TRUST PROBLEM: A PROPOSED SOLUTION.

WHETHER this country harbors real trusts in any considerable number, is a question upon which there is a difference of opinion. All agree however, that the various anti-trust laws, heretofore enacted in forty-five states, have been ineffectual in suppressing either the real, or the so-called trusts, which have called forth these laws.

The purpose of this paper is to propose a Federal Income Tax as a practicable means of solving the trust problem.

The tax to be employed, however, is not to be such a one as Congress in the sixties, levied upon incomes in general, and again, in recent years sought to impose, but one that is to be graduated under a new principle of graduation, hereinafter set out.

Before discussing the proposed tax the writer submits a few conclusions which he has reached upon the trust question. They are these:

The trust problem is but a phase of the larger social problem.

The anti-trust movement, though ostensibly directed against trusts, is in fact directed against certain evils, of which trusts are supposed to be, but are only in part, the creative agents, and the embodiment. Its real aim is to correct evils which were as pronounced before the era of trusts as now, and which would continue though trusts were crushed. Its object is to secure a more equitable division of the reward of labor, and to destroy the power, wherever lodged and however employed, of exacting from consumers, by means of higher prices, exorbitant reward for labor, and of diverting this reward to purposes other than the rewarding of labor.

So-called trusts are, largely, the result of the unrestricted, destructive competition, which brings financial disaster, at sometime, upon nine tenths of all who embark in business. This competition has made the history of our industries but a story of tragedies, whose every page tells of life and death struggles between competitors, in which the strong victors of one day were crushed the next, by others still stronger. This competition compelled those to combine who would escape its merciless wheels.

These so-called trusts are mostly but corporations which have secured a practical monopoly of the production of certain commodities. They have no powers in law, which other corporations do not enjoy in an equal measure. They possess virtues as well as vices.

They are not evils *per se*, but evils only under certain conditions. They effect large savings in cost of production, which should be welcomed, if consumers and wage-earners are allowed to share in their benefits. To crush trusts indiscriminately would be like prohibiting the use of dynamite for any purpose because it is used for criminal ends in the destructive bomb as well as for legitimate purposes in mines. It would be like excluding thousands from a beautiful park because a few vandals destroy plants therein. The abuse, and not the enjoyment of a privilege should be punished.

Every previous step in the industrial evolution, by effecting savings in cost of production and lowering prices of commodities has benefited consumers. Every such step also has benefited wage-earners as a class. Labor temporarily displaced found re-employment at better wages when an increased demand for commodities followed the lowering of prices. The formation of trusts and larger corporations is but a further step in this evolution, which, under proper guidance, will result in similar benefits.

The solution of the trust problem must therefore not be sought in the suppression of the concerns which effect savings in production, nor in permitting them to appropriate the whole of such savings in the form of larger profits. It lies in the employment of measures by which a liberal share of such savings can be made to inure to the benefit of consumers through lower prices, or to wage-earners, through higher wages, or to the government through taxes. We must aim at acceptance of such benefits as trusts afford, must abstain from interference with trusts where they freely part with the benefits arising from their savings in production, and must interfere with them only when they retain an exorbitant share of such benefits.

By their income it may be judged what disposition trusts made of these benefits. The ratio of the net income of each trust to paid-up capital, to aggregate wages paid, and to volume of business is proof with what degree of fairness it parted with such benefits, or with what degree of unfairness it retained them. These incomes must be scrutinized, and with these incomes those must primarily concern themselves who would find a practicable solution of the trust problem.

The trust which is allowed to exploit its powers and privileges to the fullest extent with impunity, and which is left in the undisturbed enjoyment of its income, however ill gotten and however much the result of extortion, will see no need of mending its evil ways. To

deny to it the right to the undisturbed enjoyment of its ill-gotten gain would be to discourage extortion on its part.

A federal tax on the incomes of trusts and corporations, so graduated as to be less or more burdensome on each trust, as each one was more or less liberal in its dealings with wage-earners and consumers, will insure to these two classes, through direct as well as indirect means, an equitable share of the benefits of the saving in cost of production, and with that done the trust problem is practically solved.

Tariff reduction on commodities controlled by trusts would be a welcome ally, and publicity in the organization and management of trusts and more extended jurisdiction of the federal government over large corporations are necessary allies in solving the trust problem.

It is to the solution of the trust problem as thus understood that the proposed tax is directed, and in its further discussion the soundness of the foregoing conclusions is assumed.

This tax is not intended to be an ordinary income tax, but one that is to be levied independent of, and in addition to any general income tax that may be contemplated. New Zealand supplements her ordinary land tax by an additional graduated land tax. She imposes the latter upon certain large estates only, and even makes it more burdensome in cases of non-resident ownership. Thus, too, the ordinary tax, which may eventually be levied on gross incomes, by whomsoever and from whatsoever source received, is to be supplemented by an additional tax on the net incomes of trusts and corporations, which tax is to be graduated according to the ratio of the income to be taxed to the aggregate wages paid for labor participating in its production.

A country which employs import duties to provide revenue and to afford protection to industries, and whose separate states wisely employ high license to provide revenue and to encourage temperance, will pursue no revolutionary lines if it employs income taxes to provide revenue and to secure a more equitable division of the reward of labor.

For want of better terms let us call the first of these income taxes a revenue income tax, and the second a remedial income tax. The first to have for its primary purpose the raising of revenue ; the second, the double purpose of raising revenue and modifying certain evils resulting from defects in our system of production and distribution. It is with the remedial income tax only that we are now dealing.

For the purposes of this tax, let us call the profits of trusts and corporations, after deductions for wages, compensation for services of proprietors, expenses, and interest on borrowed capital, their gross income. From their gross income let us deduct an amount equal to a fair rate of interest on their paid up capital, and also a sum equal to a fair rate per cent. of the wages paid by them for labor participating in its production, and let us call the balance their net income, which alone is to be subject to this tax.

Six per cent. is perhaps a fair rate to be allowed as interest on capital, and five per cent. of wages paid, a fair rate to be allowed as margin on labor employed. On net incomes, as thus ascertained, if not in excess of a sum equal to 1 per cent. of total wages paid for labor participating in their production, let there be placed a tax of 1 per cent. On net incomes in excess of 1, and not in excess of 2 per cent. of such wages, let the tax be 2 per cent. And on net incomes in excess of 2, and not in excess of 3 per cent., make the tax 3 per cent., and let the further increase in rate be in this ratio.

Suppose a corporation with a capital of $100,000, an annual wage account of $50,000, and annual gross profits aggregating $13,500. Deducting from the latter the sum of $6000 as interest on capital and $2500 as margin on wages, there would remain net income to the amount of $5000 to be taxed. On the first $500 of this the tax would be $5, on the second $500 the tax would be $10, on the third $500 the tax would be $15, and on the whole sum the tax would be $275. Suppose now another corporation with an equal amount of capital and gross income, but with an annual wage account of only $30,000. Its exemptions would be $7500, and its net income to be taxed, $6000. Its tax on the first $300 of this amount at the foregoing rate would be $3, on the second $300 it would be $6, and on the whole amount $630, thus showing a large increase in tax over the corporation paying the larger wages as compared with net profits.

This plan of reaching trusts, it is true, could be simplified by making the paid up capital of each trust, which remains fixed, instead of its wage account, which varies each year, the basis, and by graduating the tax to be levied according to the ratio of the income to paid up capital, instead of according to the ratio of such income to wages paid. With the basis of graduation thus changed the foregoing illustrations, under the same rate of tax, would furnish quite different results. In the first case the first $1000 of net income would be taxed

$10, the second $1000 would be taxed $20, and the tax on the whole $5000 would be $150. In the second case the tax on the whole net income of $6000 would reach $210.

This method of graduation would perhaps be practicable if the raising of revenue were to be the only aim of the remedial income tax. But as it would encourage increase in capital only and not increase in wage account, it would fail in accomplishing one of the ends most desired, and for that reason it need not be considered at length by those who are searching for the most practicable solution of the trust problem. The rate employed in the foregoing cases is not proposed with a view of fixing the standard, but is used only by way of illustration. If the wisdom of employing the newly found principle of graduation, in properly placing the burdens of taxation, is admitted, the most painstaking efforts of our ablest economists will be required to find a standard that shall be neither ineffectual in furthering the end desired nor confiscatory. They will have to work out the details of a plan which will enable practical application of this principle in taxing incomes, however disproportionate may be their ratio to wages paid.

This principle seems to point out a way of dealing with the social problem which lies between the extremes of individualism and socialism. It must appeal to the social reformer who believes in reforms on conservative lines, and who considers the trust problem but a phase of a wider social problem. Even the socialist, whose purity of motive is not in doubt, must perceive its merit. The latter ascribes most social ills to the private ownership of the material instruments of production and distribution, and demands their socialization in order that the reward of labor may be more equitably divided. His demands, however, include the overthrow of the existing social order. This principle aims at curing these ills through measures consistent with and operative under this order. By its aid the state, without socializing industries, but under individual ownership and control of such industries, is to encourage an equitable division of the reward of labor among those whose efforts have participated in the production of such reward.

If we fail in solving the social problem by one of the many, or by a union of some or all of the methods that have been suggested from time to time, or if we fail in crushing the power to do evil possessed by the gigantic combinations of capital which are multiplying with such amazing rapidity, and which threaten to hold consumers and

wage-earners alike so fully at their mercy, shall we not in time be confronted with the alternative of submitting helplessly to their dominion or assuming ownership of them. Even now socialists welcome these industrial giants as a step in the direction of eventual socialization of industries and the overthrow of the existing social order. Were we to discover a practicable way of imposing a federal income tax graduated in accordance with the principle hereinbefore suggested, there would be reason to hope that benefits exceeding our most sanguine expectation would follow, and the trust problem, if not the wider social problem, would give greater promise of eventual solution.

The following are some of the results to be looked for: Offending trusts and corporations, and, it may be hoped, eventually, individuals too, would be pressed to abstain from exacting excessive tribute from consumers and wage earners, or, failing so to abstain, would be forced to make amends in proportion to the extent to which labor, privileges and powers were exploited by them. Rises in prices unaccompanied by proportionate rises in wages, and reductions of wages unaccompanied by proportionate reductions in prices, would be discouraged. Trusts and corporations would carry only such chains as they chose to forge for themselves. To the most powerful of these, if content with moderate profits, the touch of this tax would be as light as to the humblest individual. Their burdens would increase with the measure of their greed. Dangers from monopolies would be reduced to a minimum. Exploitation of labor would become less common. Wages would rise. Those from whose efforts profits result would be certain of a more equitable share therein. Wage-earners, guaranteed an equitable share of the reward of their efforts through federal intervention, would become more content. Strikes and labor troubles would be avoided, and industries, freed from these, would attract unlimited capital looking for moderate returns. Individuals would take warning that capital when co-operating with labor in production must restrict itself to reasonable profits. And the government, in receipt of abundant revenue from those best able to carry the burdens of taxation, could lighten the burdens of those ill able to carry them.

I have discussed this tax as a means of dealing with trusts and corporations only. If effective as such its scope admits of enlargement. A fair and frank discussion of it will at least determine what if any merits it possesses, and to what extent it admits of being employed in solving the trust problem.

C. A. FICKE.

DAVENPORT, IOWA.

THE CONDITION OF THE NEGRO IN PHILADELPHIA.[1]

THE sociological study whose results are set forth in Dr. Du Bois's book on the Philadelphia negro had its origin in the desire on the part of a number of men and women of Philadelphia, interested in questions of social reform, for a foundation of definite knowledge on which to base their efforts. This desire culminated in a plan of co-operation between the Wharton School of the University of Pennsylvania and the Philadelphia College Settlement, by which each was to furnish a trained investigator, the Department of Finance and Economy at the university undertaking the general supervision of the entire work and the publication of results.

Dr. Du Bois was appointed assistant in sociology at the university for the special purpose of carrying on the work, and Miss Eaton, a graduate of Smith College, was secured as fellow by the College Settlement. Miss Eaton's time was specially devoted to the investigation of the negro in domestic service. The fact that while the negro forms only 12½ per cent. of the population of the United States he performs about 29 per cent. of the domestic service, made it seem desirable that special attention should be given to that form of economic activity.

The book, as a whole, is probably one of the most important contributions we have yet had toward the study of the negro problem in the United States. It is a commonplace to say that any attempt at solving a problem should be preceded by a clear understanding of what the problem involves.

The great value of this particular study lies in the fact that it presents a concrete, definite picture of the family, social, and economic life of a large negro population, in a great northern city. It is based on information gathered together by a man particularly well fitted by intellectual training, tact, and sympathy to reach the facts of the case, to see them in their true proportions, to separate cause from effect, to trace out the action of special environment, and beyond this, to set forth the results of his study in a clear, concise, and scientific manner. As, aside from the work on domestic service, all the investigation was

[1] *The Philadelphia Negro: a Social Study.* By W. E. BRUGHARDT DU BOIS, PH.D. Together with a special report on Domestic Service, by ISABEL EATON, A.M. Published for the University of Pennsylvania. Boston: Ginn & Co., 1899. 8vo, pp. xx + 520. Price $2.00; cloth $2.50.

made by one person, Dr. Du Bois himself, the errors in many statistical investigations, arising from a differing personal equation, were eliminated and the results are comparable among themselves.

Philadelphia affords one of the most favorable places for such a study, both on account of the large absolute size of the negro population and on account of the fact that almost all grades of efficiency and social conditions are to be found there. Many of the better class of colored families have been settled in the city for half a century or more, while a still larger per cent. consists of immigrants from the agricultural sections of the South, particularly from Virginia and Maryland. Of all the large cities in the United States only Washington, New Orleans, and Baltimore have as large an absolute negro population as Philadelphia. In 1890 its negro population amounted to 39,371. At the present time it is well into the forty thousands. It is interesting to note that the study of the Philadelphia negro means the study of a group of people as numerous as the population of Harrisburg, the capital of Pennsylvania, in 1890, and as large as was Philadelphia itself at the beginning of the century (p. 52). An accurate study of so large a group cannot fail to throw some light on the negro problem as a whole.

The Seventh Ward of Philadelphia, bounded by Spruce and South streets on the north and south, by Seventh street on the east and the Schuylkill River on the west, has within its boundaries about one fourth of the negro population of the city, and, owing to its location and shape, contains all the typical classes. This ward was made the basis of an intensive study, carried on by a house-to-house canvass, supplemented by a less detailed but still careful examination of the negro population of the other wards of the city, and a use of all previous statistical and historical material available for purposes of comparison.[1]

Dr. Du Bois recognizes the economic side of the problem as that which presents at the same time the greatest importance and the greatest difficulties. He states the situation on page 97:

> For a group of freedmen the question of economic survival is the most pressing of all questions; the problem as to how, under the circumstances of modern life, any group of people can earn a decent living, so as to maintain their standard of life, it is not always easy to answer. But when the question

[1] For details of scope and method of problem see first eight pages of the work, The schedules used are printed in Appendix A, pp. 400 *et seq.*

is complicated by the fact that the group has a low degree of efficiency on account of previous training; is in competition with well-trained, eager, and often ruthless competitors; is more or less handicapped by a somewhat indefinite, but existent and wide-reaching discrimination; and finally, is seeking not merely to maintain a standard of living, but steadily to raise it to a higher plane—such a situation presents baffling problems to the sociologist and philanthropist.

Before proceeding to the discussion of industrial efficiency, Dr. Du Bois devotes several chapters to a historical review of the negro in Philadelphia, and to an examination of the size, age, sex, and conjugal condition of the negro population at the present time, to a study of the sources of the negro population, and to its education and illiteracy past and present. All these are considerations which have important bearings on the industrial problem. Having outlined the complicated situation, he asks, "What are the present results?"

> What do the mass of the negroes of the city at present do for a living and how successful are they in those lines? And in so far as they are successful, what have they accomplshed, and when they are inefficient in their present sphere of work what is the cause and remedy (p. 98)?

Statistical tables show in great detail the exact employments of the negroes of the Seventh Ward. A summary of these tables shows that of the 9675 negroes in that section 1212 are children nine years of age or less. Of the remaining 8463 there are (p. 108):

At work	6,610
In school	609
Housewives	568
Known criminals	116
Unoccupied, at home, defective, unknown, etc.	560
	8,463

The 6610 at work are distributed as follows:

Professions	101
Working on own account	268
In trades	492
Clerks, semi-professional and responsible workers	212
Laborers (select)	778
Laborers (ordinary)	2,111
Servants	2,644
	6,610

We can grasp the true meaning of these figures only by comparing the distribution of occupations among the negroes with that of the total population of the city; for this purpose we must redistribute the occupations according to the simpler, but in many respects unsatisfactory divisions of the United States Census. We then have (p. 108):

	Whole population of Philadelphia, 1890		Negroes of Seventh ward, 1896	
	Number	Per cent.	Number	Per cent.
Total population over 10	847,283		8,463	
Number in gainful occupations	466,791		6,611	
Per cent. in gainful occupations		55.1		78
Engaged in agriculture	6,497	1.5	11	.2
Engaged in professional service	19,438	4.2	130*	2.0
Engaged in domestic and personal service	106,129	22.7	4,889	74.3
Engaged in trade and transportation	115,462	24.7	1,006	15.3
Engaged in manufacturing and mechanical industries	219,265	46.9	541	8.2

*Omitting 24 students 21 years of age and over.

A comparison of these statistics shows a percentage very much greater than that of the general average for the city of those engaged in gainful occupations. It is what was to be anticipated. According to Dr. Du Bois it indicates an absence of accumulated wealth, arising from poverty and low wages. The causes of poverty are largely historical in character. Low wages are explained when we consider the few occupations to which the negroes are limited and the great competition that ensues.

This is true among the men and especially true among the women, where the limitation is greatest. All the forces that are impelling white women to become bread-winners are emphasized in the case of negro women; their chances of marriage are decreased by the low wages of the men and the large excess of their own sex in the great cities;[1] they must work, and if there are few chances open they must suffer from competition in wages. Among the men low wages means either enforced celibacy or irregular and often dissipated lives, or homes where the wife and mother must also be a bread-winner. . . . 16.3 per cent. of the native white women of native parents and of all ages, in Philadelphia, are bread-winners; their occupations

[1] In Philadelphia there are 1383 females to every 1000 males. The excess is largely explained by the fact that from the beginning opportunities for women in large cities have been greater than those for men through their large employment in domestic service (p. 54).

are restricted, and there is great competition; yet among negro women, where the restriction in occupation reaches its greatest limit, nevertheless 43 per cent. are bread-winners, and their wages are at the lowest point in all cases save in some lines of domestic service where custom holds them at certain figures; even here, however, the tendency is downward (pp. 110, 111).

The causes which limit the occupations of the negro are twofold—first the inefficiency which comes from lack of experience and training, and second, the prejudice of the whites.

On the first point Dr. Du Bois says (pp. 133, 134):

The most noticeable thing about the negro laborers as a whole is their uneven quality. There are some first-class, capable and willing workers, who have held their positions for years and give perfect satisfaction. On the other hand, there are numbers of inefficient and unintelligent laborers, on whom employers cannot rely and who are below average American labor in ability. This unevenness arises from two causes: the different training of the various groups of negroes comprising the city population; some are descendants of generations of free negroes; some of trained house-servants, long in close contact with their masters' families; others are the sons of field-hands, untouched and untrained by contact with civilized institutions; all this vast difference in preparation shows vast differences in results. The second reason lies in the increased competition within the group, and the growing lack of incentive to good work, owing to the difficulty of escaping from manual toil into higher and better paid callings; the higher classes of white labor are continually being incorporated into the skilled trades, or clerical workers, or other higher grades of labor. Sometimes this happens with negroes, but not often. The first-class ditcher can seldom become foreman of a gang; the hod-carrier can seldom become a mason; the porter cannot have much hope of being a clerk, or the elevator boy of becoming a salesman. Consequently we find the ranks of the laborers among negroes filled to an unusual extent with disappointed men, with men who have lost the incentive to excel, and have become chronic grumblers and complainers, spreading this spirit further than it would naturally go. At the same time this shutting off the natural outlet for ability means an increase of competition for ordinary work.

Again the action of the trades unions, which, with few exceptions, practically exclude negroes from membership, has shut them out of occupations for which many of them are well fitted. In the middle of the century a considerably larger number were engaged in Philadelphia in such trades as carpentering, masonry, and plastering. The exclusion is maintained in some cases by the insertion of the word "white"

among the qualifications for membership. More often there is no general rule, local bodies being left to their own discretion in the matter. This means that where negro labor is competent and a considerable factor as to quantity, as in western Pensylvania among miners and iron-workers, they are not only allowed, but solicited, to join the unions. Where they are few in number and comparatively inefficient, it is impossible for even a skilled workman to gain admission. In Philadelphia they are well represented in the cigar-makers union.

The carpenters, masons, painters, iron-workers, etc., have succeeded in keeping out nearly all negro workmen by simply declining to work with non-union men and refusing to let colored men join the union (p. 128).

This refusal is not so much a matter of class prejudice as it is the grasping and keeping of an economic advantage.

Class prejudice is, however, one of the chief causes which prevent the negro from acquiring experience and from gaining in efficiency by doing. It is shown by the investigation that, as a rule, it is difficult for a negro family, no matter how respectable, to rent a house on a good residence street, in a respectable neighborhood occupied chiefly by whites. As a result of this discrimination in the matter of renting at fair rates, the negro is restricted to certain portions of the city inhabited chiefly by his own race, or by the lowest of the foreign white population. All the incentive that would come from living beside people whose standard of life is possibly higher than his own is lost. Imitation, which sociologists have shown to be so powerful a force in molding a civilization, has a limited opportunity in which to work. This herding together results, in turn, in an identification, in popular opinion, of the better element of the mass with the less efficient and criminal element, a lack of discrimination which removes one of the most powerful incentives to rise.

The delicate question of class prejudice is treated by Dr. Du Bois with great restraint and impartiality. The tone is not that of a reformer pleading for justice against a great wrong, but that of the scientific investigator who looks at things as they are and states what he sees without praise or blame.

He acknowledges that most negroes

regard this prejudice as the chief cause of their present unfortunate condition. On the other hand, most white people are quite unconscious of any such powerful and vindictive feeling; they regard color prejudice as the easily explicable feeling that intimate social intercourse with a lower race is

not only undesirable but impracticable if our present standards of culture are to be maintained (p. 322).

The truth Dr. Du Bois believes to lie between these two extremes. The practical results of such prejudice as exists today in Philadelphia he finds to be on the economic side (pp. 323, 324).

1. As to getting work:

No matter how well trained a negro may be, or how fitted for work of any kind, he cannot in the ordinary course of competition hope to be much more than a menial servant.

He cannot get clerical or supervisory work to do save in exceptional cases.

He cannot teach save in a few of the remaining negro schools.

He cannot become a mechanic except for small transient jobs, and cannot join a trades union.

A negro woman has but three careers open to her in this city: domestic service, sewing, or married life.

2. As to keeping work:

The negro suffers in competition more severely than white men.

Change in fashion is causing him to be replaced by whites in the better paid positions of domestic service.

Whim and accident will cause him to lose a hard-earned place more quickly than the same things would affect a white man.

Being few in number compared with the whites, the crime or carelessness of a few of his race is easily imputed to all, and the reputation of the good, industrious, and reliable suffers thereby.

Because negro workmen may not often work side by side with white workmen, the individual black workman is rated, not by his own efficiency, but by the efficiency of a whole group of black fellow workmen, which may often be low.

Because of these difficulties which virtually increase competition in his case he is forced to take lower wages for the same work than white workmen.

3. As to entering new lines of work:

Men are used to seeing negroes in inferior positions; when, therefore, by any chance a negro gets in a better position, most men immediately conclude that he is not fitted for it, even before he has a chance to show his fitness.

If, therefore, he set up a store, men will not patronize him.

If he is put into public position men will complain.

If he gain a position in the commercial world, men will quietly secure his dismissal or see that a white man succeeds him.

4. As to his expenditure:

The comparative smallness of the patronage of the negro, and the dislike of other customers, makes it usual to increase the charges or difficulties in certain directions in which a negro must spend money.

He must pay more house rent for worse houses than most white people pay. He is sometimes liable to insult or reluctant service in some restaurants, hotels and stores, at public resorts, theaters and places of recreation; and at nearly all barber shops.

5. As to his children:

The negro finds it extremely difficult to rear children in such an atmosphere and not have them either cringing or impudent; if he impresses upon them patience with their lot, they may grow up satisfied with their condition; if he inspires them with ambition to rise, they may grow to despise their own people, hate the whites, and become embittered with the world.

In such economic conditions what are the incomes a negro may hope to win, and does he ever succeed in accumulating property?

Exact data with regard to incomes were very difficult to obtain, and the result must be regarded simply as careful estimates. Considering a family of five as the unit, Dr. Du Bois reaches the conclusion that about 19 per cent. of the negro families in the Seventh Ward earn $5 and less per week on the average; 48 per cent. earn between $5 and $10; 26 per cent. $10 to $15; and 8 per cent. over $15 per week. They are thus divided roughly into four groups: first, the "very poor and poor;" second, "fair;" third, "comfortable;" and fourth, "in good circumstances." As Dr. Du Bois notes, the whole division into "poor," "comfortable," and "well-to-do," depends primarily on the standard of living among a people. An examination into typical family budgets in each class shows one feature common to all. It is commented upon as follows (p. 178):

Probably few poor nations waste more money by thoughtless and unreasonable expenditure than the American negro, and especially those living in large cities like Philadelphia. First, they waste much money in poor food and in unhealthful methods of cooking. The meat bill of the average negro family would surprise a French or German peasant, or even an Englishman. The crowds that line Lombard street on Sundays are dressed far beyond their means; much money is wasted in extravagantly furnished parlors, dining rooms, guest chambers, and other visible parts of the homes. Thousands of dollars are annually wasted in excessive rents, in doubtful "societies" of all kinds and descriptions, in amusements of various kinds, and in miscellaneous ornaments and gewgaws.

This living up to or in excess of income naturally prevents any accumulation of property. Nevertheless there are exceptions. From the best evidence available it appears that

> One hundred and twenty three of the 2441 families in the Seventh Ward, or 5.3 per cent., own property in the ward; 75 other families own property outside the ward, making in all 197, or 8 per cent. of the families who are property holders. It is possible that omissions may raise this total to 10 per cent. The total value of this property is partly conjectural, but a careful estimate would place it at about one million dollars, or 4½ per cent. of a ward where the negroes form 42 per cent. of the population (p 179).

A prominent colored citizen of Philadelphia once said in a public address, that the course of Philadelphians toward the negroes, in making every effort to give them an education and then shutting them out of every better avenue of industry was much like that of an engineer who gets up steam in his boilers and then sits on the safety valve. Dr. Du Bois's investigation of the educational facilities of Philadelphia show that in that city, at least, it is quite possible for a negro boy to pass from the lowest primary grade through the high school and into the university. Very few, however, can or do take advantage of this possibility. Still the question of education, in its ordinary sense, *i. e.*, the passing through school and college, is not the most pressing question at this time. "To educate boys and girls and then to refuse them work is to train loafers and rogues" (p. 354).

The serious obstacle to progress at the present has arisen through lack of opportunity, unrewarded merit, and unsatisfied ambition. These have created a social environment very dangerous to the growing boy and girl.

> For thirty years and more Philadelphia has said to its black children: "Honesty, efficiency, and talent have little to do with your success; if you work hard, spend little, and are good you may earn your bread and butter at these sorts of work which we frankly confess we despise; if you are dishonest and lazy, the state will furnish you bread free." Thus the class of negroes which the prejudices of the city have distinctly encouraged is that of the criminal, the lazy, and the shiftless; for them the city teems with institutions and charities; for them there is succor and sympathy; for them Philadelphians are thinking and planning; but for the educated and industrious young colored man who wants work and not platitudes, wages and not alms, just rewards and not sermons; for such colored men Philadelphia apparently has no use (pp. 351, 352).

So much space has been given to an attempt to show something of Dr. Du Bois's conclusions respecting occupations and causes affecting their limitation, that it is only possible to mention the chapters on Health; the Family Life; Organized Life, including charities, secret and benefit societies, and co-operative business; the Negro Criminal; the Environment of the Negro, *i. e.*, section and ward, housing, social classes and amusements; the Contract of the Races, including the question of intermarriage, and Negro Suffrage.

In the short final chapter Dr. Du Bois allows himself a word as to "the meaning of all this." The negro problem seems to be bewilderingly complicated, nevertheless it is not more hopelessly complex than many others have been which have been solved by time. The possible solution offered in the gradual dying out of the race is rejected.

> A nation that has endured the slave trade, slavery, reconstruction, and present prejudice three hundred years, and under it increased in numbers and efficiency, is not in any immediate danger of extinction. Nor is the thought of voluntary or involuntary emigration more than a dream of men who forget that there are half as many negroes in the United States as Spaniards in Spain. If this be so ,a few plain propositions may be laid down as axiomatic:
>
> 1. The negro is here to stay.
>
> 2. It is to the advantage of all, both black and white, that every negro should make the best of himself.
>
> 3. It is the duty of the negro to raise himself by every effort to the standards of modern civilization and not to lower these standards in any degree.
>
> 4. It is the duty of the white people to guard their civilization against debauchment by themselves or others; but in order to do this it is not necessary to hinder and retard the efforts of an earnest people to rise, simply because they lack faith in the ability of that people.
>
> 5. With these duties in mind and with a spirit of self-help, mutual aid and co-operation, the two races should strive side by side to realize the ideals of the republic and make this truly a land of equal opportunity for all men (pp. 388, 389).

In the *Special Report on Negro Domestic Service* (pp. 427–509), Miss Eaton points out the importance of the study in the light not only of its relation to the negro problem but to the vexed question of domestic service in general. The colored population of the United States

> Perform about three times as much domestic service in proportion to their numbers as the whites do. From this it will be seen that while the study of domestic service in any consideration of the condition of the colored people is important, the study of the negro domestic is equally important in any careful consideration of the domestic service problem (p. 433).

The returns of the last census show that very nearly 60 per cent. of the colored working men of Pennsylvania are engaged in domestic service, while over 91 per cent. of the colored working women of the state are in service (p. 428). This proportion is greater than that found in the Seventh Ward, but in the census classes of persons are included which are scheduled elsewhere in this report.

The great source of supply of Philadelphia's domestic service comes from Maryland and Virginia, these two states contributing 48.2 per cent. of the total. An investigation as to the age of domestic servants shows that nearly one half the colored domestics of Philadelphia, both men and women, are included in the age period between twenty-one and thirty years.

The chapter on grades of service brings out facts of considerable interest. It shows that men in domestic service receive close upon 100 per cent. more wages than women. There is greater equality, however, between the wages of white and colored women than between that of white and colored men. The results of the investigation seem to show that color makes little difference in the former case while in the case of men, in the higher grades of service at least, the whites receive a considerably larger wage. This is largely owing to fashion, since the English butler, coachman, etc., are at present the proper thing. The supply being more limited, the pay rises.

The following table explains why Englishmen, accustomed to domestic service at home, are attracted to the United States.

An absolute money wage, in many cases 100 per cent. greater, is a strong attraction to emigration.

TABLE X (p. 452).

TABLE COMPARING ENGLISH AND AMERICAN "MONEY WAGES."

(Annual amounts over and above board and lodging.)

	Sub-occupations	London [1]	Colored domestics in Philadelphia	United States	Philadelphia
Women	General servant	$ 77.50	$168.48	Aver. women's wgs	Ave. women's wgs
	House maid	82.50	164.84		
	Cook	109.50	209.04	$167.96	$179.92
Men	Errand boy	55.00	135.72	Average men's wages	Aver. colored men's wages
	Footman, coachman	175.00	446.16		
	Butler, colored		428.48		
	Butler, white	300.00	540.00	$373.36	$335.40

[1] CHARLES BOOTH, *Life and Labor of the People*, vol. viii. pp. 217, 223.

[2] SALMON, *Domestic Service*, p. 28.

On page 453 the question of the effect of board and lodging on wages is considered. Miss Eaton says:

> In the Philadelphia investigation the facts upon this point seem to indicate that the amount of wages is only slightly affected, if at all, by the question of board and lodging. When these are given in addition to wages they apparently do not stand, in the mind of either employer or domestic, as part payment for service. A comparison of the pay of women cooks, who lodge at their place of work, with that of women cooks who lodge at home, will illustrate this. The average pay of those who lodge at their place of work, and therefore receive board and lodging in addition to wages, is $4.13, as contrasted with $3.95 received by those who go home at night. Here the difference will be seen to be in the opposite direction from what we should expect if board and lodging are included as part of the wages of cooks. The same facts hold good for the other sub-occupations among colored domestic servants in the ward.

A comparison of wages of colored domestics with the wages of those in other occupations, shows that for the women it is one of the well-paid employments. This is true not only of colored but white domestics, as the investigation of Miss Salmon into the comparative savings of domestics, public-school teachers, and factory operators shows.[1]

The chapter on savings and expenditure brings out the interesting fact that, as a rule, in spite of their much larger wages, the men domestics do much less than the women toward the support of dependents. The per cent. of those who save is about the same in both sexes. The figures must be taken with considerable allowance, but with the best results attainable there were only about 15 per cent. in both sexes who saved nothing at all. The men, as a rule, prefer to deposit their savings in savings banks, while there seems to be a rather general distrust of banks on the part of the women. They prefer "societies," or saving at home.

Other chapters treat of Amusements and Recreations, Length and Quality of Domestic Service and Conjugal Conditions, Illiteracy and Health.

"In view of the general purpose of the investigation," Miss Eaton considers, in the last chapter, ideals of betterment in Philadelphia Negro Domestic Service, which she believes to be no different from the "ideals" of domestic service as a whole. "When the domestic

[1] L. M. SALMON, *Domestic Service*, p. 446.

becomes a 'trained worker, honorable and dignified,'" the great objection now felt in the loss of social standing and in the personal relations between employers and employee will be met.

Miss Eaton's report is valuable for the light it throws on an important side of the negro problem, but it may not be amiss to point out that it is perhaps of still broader social worth in being the third scientific attempt[1] to find a basis of fact for the study of domestic service in general.

KATHARINE BEMENT DAVIS.

[1] The two previous studies are CHARLES BOOTH'S *Life and Labor of the People*, vol. viii., and MISS SALMON'S *Domestic Service*.

BOOK REVIEWS.

Science of Statistics: Part II, Statistics and Economics. By RICHMOND MAYO-SMITH. New York: The Macmillan Company, 1899. Pp. xiii+467.

THE appearance of the promised second volume of Professor Mayo-Smith's *Science of Statistics* has been awaited with interest by students of statistics in the United States. While the mass of official statistics concerning economic conditions has grown at a rapid rate, but comparatively little has been done in the way of subjecting this material to a rigid critical examination with a view to determining its value and the more important conclusions to be drawn from it. This lack was to a certain extent met by the report of the Committee of the American Economic Association on the Twelfth Census. This work, however, was restricted to the consideration of those subjects only to which the census relates, and was prepared by different persons to a considerable extent working independently of each other. In the present volume we have a methodical treatment from a single pen of economic statistics generally. Professor Mayo-Smith's work thus has as its first merit that it meets a real want.

In successive chapters the author examines available statistics concerning the more important features of economic life: Consumption, Population as a Labor Force, Land as a Factor of Production, Capital, Wealth, Prices, Money and Credit, Transportation and Commerce, Wages, Rents, Interest and Profits, Labor Disputes, Associations, Finance, Statistics, and Wealth and Incomes and their Distribution. The method pursued, that of first stating the economic question and then following with a consideration of the statistical material that bears upon it, has the great value of bringing out the gaps in the statistical information that it is desirable to have, as well as the material that is actually in existence.

While Professor Mayo-Smith has undoubtedly given us an exceedingly valuable analysis and criticism of existing economic statistics, and one that will contribute not a little to the advancement of the study of statistics in the United States, his work is open to criticism in one or two respects. The first of these is, that as regards a number of

important questions involving a choice of methods, the author has not always stated clearly his own conclusions. After reproducing certain statistics, reference is repeatedly made by a footnote, as on pages 78, 82, and 97 for example, to the fact that the validity of the method pursued in their compilation has been questioned, without any expression of opinion as to whether such criticism is justified or not. In other cases the pros and cons of a problem are given without any attempt to state a conclusion.

A second criticism relates rather to what the book is not than to what it is. The general title *Science of Statistics* is scarcely justified by the contents. Leaving aside the more than doubtful claim of statistics to be considered a science, a book so entitled should cover the whole ground of statistics in a fairly comprehensive and well proportioned way, with especial emphasis upon general rather than particular methods of procedure. This the work does not do. The great problems with which the directors of statistical work have to deal receive but scant or no attention. Of the subjects treated some are considered at length while others of equal importance receive but brief mention. As an instance of the latter may be mentioned the important class of provident and savings institutions which are scarcely mentioned though they are peculiarly susceptible of statistical treatment.

In conclusion, it should be said, that by the foregoing criticism it is by no means intended to convey the idea that Professor Mayo-Smith's book is other than one of extreme value to all persons interested either in statistics or economics. It was only desired to point out what to us seemed the ground that is and is not covered by it. With the method and conclusions of the author when expressed it is difficult to find fault. The questions treated have been handled with a rare skill, and the two volumes stand today as the best treatise on statistics in English and compare favorably with any in a foreign language.

W. F. WILLOUGHBY.

The Growth of Cities in the Nineteenth Century: A Study in Statistics. By A. F. WEBER. (Studies in History, Economics, and Public Law, XI, edited by the Faculty of Political Science of Columbia University.) New York: The Macmillan Company, 1899, pp. xvi + 495.

THIS remarkably well-executed monograph is an outgrowth of a doctoral dissertation. It fully warrants its expansion into this more

attractive shape for the purposes of the general reader, dealing as it does with a striking phenomenon of the nineteenth century. No previous work in English deals at all so comprehensively with the subject; and none of the foreign ones, of which there are several, contains any extended treatment of the American data.

The first chapter contains an admirable discussion of statistical methods to be used in the determination of the facts concerning "agglomeration." The fallacy in average density of population statistics is made clear. Mere agglomeration, moreover, is insufficient as a social criterion, unless the absolute size of towns be also taken into account. The closely built hamlets of Europe represent agglomeration indeed as compared with American isolation; yet only when in excess of a certain size do they conform to the circumstances of real urban life.

After a comprehensive treatment of the history of urban growth the author engages in the third chapter in a discussion of the causes of urban concentration of population. Having already shown historically that the greatest general acceleration of urban growth has taken place since 1850, although in England and Scotland, Belgium, Saxony, and France in diminishing degrees, such concentration somewhat antedates the middle of the century, the prime causes in such movements are incidentally suggested as the industrial revolution and the development of transportation services. Such economic causes inherent in modern capitalism are strongly re-enforced by other social and political ones. Thus men, once grafted upon urban life, permanently acquire the social habit, just as industrial promoters tell us that they take on the telephone, the typewriter, and the street-car habit. Coincidently with all these changes of material habits, and more important than any of them, they acquire the ambition habit. Being well out of the rut of customary observance, they begin to aspire socially. Social aspirations can never flourish on a truly agricultural basis. They may persist on a land-owning basis, as in England today, but never on one of actual cultivation as a means of livelihood. And finally among causes of agglomeration is to be mentioned the political one, of centralization of administration.

Urban growth and internal migration form the main topics in chapter IV. Recent rapidity of urban growth is, in a very suggestive criticism, shown to be due not so much to accelerated migration cityward as to a diminution of urban death rates. It is not that so many

more men relatively emigrate to the towns which causes their phenomenal increase of size, but that those who are already there or go there live longer and better. To use a phrase, which I have coined for use elsewhere, the ratio of urban "persistency" has become greater. This study of internal migration in Europe and America brings out at the hands of our author several significant facts. It is predominantly for short distances. The spheres of attraction are variable according to the size and importance of the town, although American modes of migration city-ward betray some peculiarities in these respects.

Chapters v, vi, and vii are admirable examples of statistical analysis, dealing with the demographic peculiarities of urban population. Such populations contain an unusual proportion of women, of middle-aged adults, and usually of those of foreign birth. The striking fact, however, is emphasized that "in the United States and in most of the commonwealths the percentage of foreigners has uniformly and almost steadily increased since 1850, while on the other hand it *has decreased in the cities*." This is contrary to common opinion, but appears to be true exactly as stated. Other vital peculiarities of urban populations are shown to be the existence of a distinctly higher divorce rate and an abnormal death rate as compared with the country; but, on the other hand, marriage and birth rates are but little above the country standard, except in England and the United States. The overwhelming predominance of social over mere numerical considerations in the determination of such phenomena is very well emphasized. We are strongly tempted, did the limits of this review permit, to examine the very interesting question in this connection respecting the fact and causes for the greater proportion of female births in city populations. Some years ago[1] we ventured to suggest ethnic crossing as a partial explanation for the phenomenon. Diligent search since then has shown the phenomenon to be too general to strengthen this hypothesis. It remains, however, not impossible that the lesser degree of inbreeding may be of contributory influence. A problem in pure science awaits analysis so soon as data is available.

Our author, rather unduly, perhaps, disparages the value of existing vital statistics in the United States, sharing the general impression therein. We are inclined to take issue with this; and to maintain that a large mass of good raw statistical material is in existence in records

[1] "Ethnic Influences in Vital Statistics," *Publications of the American Statistical Association*, n. s., vol. v. 1896, p. 23.

and elsewhere. It needs publication, of course, and the calculation of rates on a population basis, before it can become available for general use.[1]

Chapter VII, upon the physical and moral health of city and country, deals at length with the sociological theories of Hansen, Ammon, and Lapouge. The question at issue in them all is as to the degree of natural selection involved in city ward migrations and the growth of urban populations. Kuczynski, it would appear, has furnished the principal fund of ammunition utilized in this connection. There can be little doubt that Hansen and Ammon both overstated the case. The tendency of city populations is certainly not so rapidly downward as their hypotheses imply. Nevertheless the facts of selection, strongly operative, remains true. This, for example, would seem to be shown in the data respecting bodily stature, collated in our study of the physical anthropology of Europe.[2] Dr. Weber had but half the facts in this connection at his command. While it is true, as he shows, that generally speaking urban populations are on the average shorter than rural ones, nevertheless a detailed analysis shows that this lower average of physical development is compounded of two elements. City populations contain an abnormally high proportion of stunted individuals; and in most cases an equally abnormal high proportion of finely developed ones, as compared with the country. A powerful process of social selection has attracted and favored the growth of each class in varying proportions. Any student in this field cannot but realize the great difficulty in utilizing social statistics in these ways. For example, the proportion of insanity is commonly taken as a test of deterioration, and the high proportion in city as compared with country, is quite generally held to be an unfavorable sign. Yet, consider how hazardous to argue on this question until we have more uniform practice in the treatment of the insane. In the cities insanity is quickly detected; it must be dealt with at once. A harmlessly insane person cannot be tolerated in a tenement as in an isolated farmhouse. Moreover, the classifications in city and country differ. Our Boston Board of Trustees of Pauper Institutions, on coming into power, proceeded at once and properly to cause the transfer of a large number of cases of senile dementia from the pauper

[1] *Cf.*, for example, the admirable social study on Divorce from county records in Ashtabula county, Ohio, in the *Century Magazine*, vol. lix. (1900), pp. 636–640.

[2] *The Races of Europe* (1899), pp. 552 *et seq.*

institutions to those for the care of the insane. This is rarely done in country towns. How different may be the effect of such practices is apparent at once. It may even be, that rightly classified and judged, there is no greater proportion of insanity in city than in country after all; perhaps even the reverse.

The two concluding chapters in Weber's work discuss the general effects of concentration of population; and present tendencies and remedies. Fees for settlement, agricultural improvements, village amusements, administrative decentralization, the growth of suburban transportation, and the possibilities of widespread distribution of electric power for use in house industry are all passed in review.

The work as a whole is a masterpiece of statistical research and of social analysis. It cannot fail to be of great use to all students engaged in investigation along these lines. The bibliographical details, despite their abundance, evince careful proof reading. The only improvement which could be suggested, would be the adoption of some definite scheme of reference, with full titles of all works cited in a separate list at the end. Typographical errors, such as we note on page 85 are rare; and good working indexes by author and subject serve to render the material easily accessible.

WILLIAM Z. RIPLEY.

Outline of Practical Sociology, with Special Reference to American Conditions. By CARROLL D. WRIGHT, LL.D., U. S. Commissioner of Labor. New York: Longmans, Green & Co., 1899. 12mo. pp. xxviii + 431.

THE unity of a book may be scientific or artistic. In the former case it proceeds by successive logical steps from point to point until some whole has been described and the intrinsic connection of its parts displayed. In the latter case the unity is vital rather than logical; the thoughts or actions of some individual or group, real or fictitious, are the informing principle. In a study so inchoate as sociology, no high degree of scientific coherence is to be found, and the unity of the volume before us is almost as much artistic as scientific. It is a simple presentation of the results of a lifetime of investigation and thought upon the problems of modern American society. The motives for inclusion or exclusion of topics are more often personal experience or interest than the requirements of systematic presentation. A

genuine review of the book, therefore, should be a review of the life of which it is an outcome and epitome. It is largely statistical, not because the writer proves that this method should be more extensively employed than his predecessors in sociology have done, but because it is natural for him to reason in figures, as it is for a poet to write in meter. It is hopeful in tone with the buoyant optimism of a man who has made his own way and believes "God's in his heaven, all's right with his world." The writer has done as much as any living American to increase public interest in statistical study of social problems and this work brings into compact, if not connected, form his conclusions upon the population of the United States, its social and political groups, the city, the family, the school, the factory, wealth and poverty, drunkenness and crime.

In the definition of sociology the clear good sense of Commissioner Wright guides him to a conclusion that has been missed by many a more ambitious writer. Sociology is "the study of the origin and development of social institutions" (p. 2). In this definition the words, "origin and development," may be omitted, for they merely describe a method favored by many sociologists, the evolutionary method, the utility of which for the study of social phenomena is much overrated in popular thought. They do not aid in defining the field of study. But if sociology be "the study of social institutions" it is difficult to prove the unity of the subject and so its scientific character. What common characteristics have families, cities, trade unions, schools, factories, and prisons? Are the points of agreement so numerous and fundamental that for a study of them a separate science should be constituted? By the manner of his treatment the author seems to reply in the negative, but by the title of his book in the affirmative, and thus exposes himself to the objection that he is trying to blow hot and cold at once. Sociology is the popular word to conjure with and as a title to this book it covers social institutions so diverse and disconnected that the unity implied in the title is lost from view. Disregarding the claim implied in the title, however, the book is a welcome addition to our popular and elementary books describing social structure and life. It is healthful in tone and will be a corrective to much crude and shallow thinking, especially such as is pessimistic in its attitude towards present society and disposed to seek a way of escape in an increased compulsory subordination of the individual to the state.

Practical Sociology is designed for private reading, or as a text-book for elementary classes, and for both purposes it seems to me on the whole more serviceable than any other book I know. Yet certain faults call for mention in an appreciation of the book. When the writer enters the academic field he is not always sure-footed. He is fond of quoting the saying of "the German Schlosser that 'statistics is history ever advancing'" (p. 8). Perhaps not one American in a million cares a picayune whether this was said by Schlosser or Schlözer, but in fact they were two different men and the saying comes from the latter. But the quotation involves a more serious error. The sentence of Schlözer was "Statistik ist stillstehende Geschichte, Geschichte eine fortlaufende Statistik;"[1] that is, "Statistics is history at rest, history is statistics in progress," obviously a different notion from that in Commissioner Wright's translation. Still further, however, the meaning of the word "Statistik" in Schlözer's time was very different from that of statistics to us. To him it meant a descriptive political science making almost no use of numerical data, but rather, as its name implies, the science of states. Its votaries got into difficulties with the students of political history and Schlözer sought to make peace with a phrase. Political science, he said, is history with change disregarded, history is political science with the element of change introduced. His effort failed, but his phrase survived. It may have originated in Huder's saying twenty years earlier that political geography is history at rest and history geography in motion and it may have suggested to Freeman his "History is past politics; politics is present history," but it never meant the statistics in which our author and his readers are interested.

Errors of this sort, however, are very infrequent in the volume. A more common kind are those springing from an uncritical acceptance of authorities. The writer has worked over very wide fields and cannot have tilled deeply in all. Thus he says that the population of the coast swamps and the Mississippi alluvial region consists mainly of negroes (p. 29). The census volûme so states, but a scrutiny of the tables, from which the inference is made (*Eleventh Census*, *Population*, I, xlvi *et seq.*), shows that whites compose more than half the population in the coast swamps. Again, the statement that the population of the country is increasing at all altitudes (p. 30) is drawn from the census volumes, but the table there found (*idem*, p. xlviii) shows that the population

[1] I have not been able to find a copy of the original, but both John and Meitzen give the sentence as quoted.

living between 9000 and 10,000 feet above sea level, *i. e.*, in Nevada and eastern California, decreased sharply between 1880 and 1890.

A few errors have been noticed so serious that one has to suspect they betray the hand of a subordinate whose work has not been reviewed and corrected with the requisite care. Thus the fact that in 1890, among the persons over twenty, there were about 377,000 more married men than married women, is explained by the influx as immigrants of married men, who have left their wives in the mother country (p. 153). One need not go so far to sea for an explanation and overlook the fact that among the persons under twenty, there are nearly three hundred thousand more married women than married men. That is, the number of women under twenty married to men over twenty exceeded the number of men under twenty married to women over twenty by 298,648, which accounts very simply for nearly four fifths of the excess of husbands in the population over twenty.

These are but minor and infrequent defects. The book is strong in its conception of sociology, in its instinctive emphasis upon statistical methods, in its spirit and temper, and in its successful maintenance of a happy mean between abstract profundity and feeble superficiality. It should lead many to go further in the subject and thus secure its highest end.

W. F. WILLCOX.

CENSUS OFFICE,
Washington.

The Cost of Living as Modified by Sanitary Science. By ELLEN H. RICHARDS. New York: John Wiley & Sons, 1899. 12mo. pp. 121.

THIS book consists of nine talks on the relation of domestic economy to social welfare. The author is speaking to that portion of the community dependent upon incomes of $1500 to $3000. They are told that household management today is, among all classes, both aimless and extravagant; that because of this waste in the center of consumption — the home — the social gains from improvements in production are largely neutralized and dissipated. Changes for the better are not to be expected from the wealthier classes who have no needs, nor from the masses who have no choice. Therefore the middle class is given the message, in the hope, that when convinced that it is to their interest as a class, they will set the example for the less fortunate

portion of the community, and initiator and imitator will work together for a much needed social economy.

The absence of a fixed plan or principle of selecting utilities is the great defect in household management. The effort toward a higher, fuller life must be conscious — choice not drifting — income must be spent with an ideal in view — expenditures must be confined to those objects which contribute to the attainment of that ideal. Sanitary science furnishes the criterion by which objects are to be selected or rejected viz., health — health of body and health of mind. The author not only criticises the typical budget of the present, but presents ideal budgets. We are shown how to study the nutrition value of various foods, the healthiness of different kinds of dwellings and location and clothing as well as the importance of various elements contributing to healthfulness of mind. The chapters are equally stimulating, and teem with practical suggestions. It is to be hoped that the author's prophecy will be fulfilled at no distant date, that the time is coming when educators and economists will unite in raising the home to its proper position, when household management will be regarded as a business, and when its director will be required to have knowledge and skill in some measure commensurate with the interests at stake.

For our purposes, however, the significance of the work is its economic philosophy. It reinforces, in a concrete, popular, imaginative way, the theory of eminent economists that the time has come for social philosophy to give more attention to problems of consumption. The management of a household is a great business — the distribution of the expenditure is of more importance to the middle and lower incomes than is the distribution of the product of industrial operations. Furthermore, we may confidently expect more directly to effect changes in the distribution of product, by teaching all classes to make better use of the share which actually comes to them, than by making them discontented with that share.

While exhorting to a higher motive than the desire to outdo one's neighbor, yet the author has skillfully taught the emulator and imitator how he may imitate with better success, if he will only study the investment in his home furnishings, foods, rentals etc. as he scrutinizes outlay in other business ventures. Thus again contributing an important suggestion, as to method of economic and sanitary education — it is not enough to antagonize existing institutions, it is necessary to suggest modifications which seem to enhance the values

of present utilities. Sanitary science brought to the aid of existing ideals, will surely accomplish more than when that science comes with a challenge to every taste and habit.

Social welfare demands of the twentieth-century housekeeper

First of all, a scientific understanding of the sanitary requirements of a human habitation; second, a knowledge of the values, absolute and relative, of the various articles which are used in the house, including food; third, a system of account-keeping that shall make possible a close watch upon expenses; fourth, an ability to secure from others the best they have to give, and to maintain a high standard of honest work. The great industrial and economic questions of the twentieth-century center about household management. The higher purposes of home life must come into sight, and be the dominating factors unless the present civilization is to pass away.

WILLIAM ALLEN.

UNIVERSITY OF PENNSYLVANIA.

Monopolies and The People. By CHARLES WHITING BAKER, C.E. Third Edition. New York: G. P. Putnam's Sons, 1899. 8vo. pp. xxiii + 368.

TEN years having elapsed since Mr. Baker first brought out his *Monopolies and The People*, an enlarged edition is now issued, which in addition to the chapters published a decade ago, contains some hundred pages of new matter. A half of this is descriptive, giving a survey of the growth of trusts during the past ten years, and showing to what extent large organizations dominate various branches of industry. Though the details are not so full as some might wish, the account is interesting, and serves well to emphasize the industrial revolution now in progress. The remainder of the book presents some of the author's conclusions regarding the evils wrought by these changes, and his suggestion of remedies.

Despite the long-continued attention which the author has given the subject, it is legitimate to question whether the conclusions which he draws are valid, for the logic at times seems unsound, and the evidence adduced in support is not altogether satisfactory. One statement which challenges criticism is that a marked result of the recent development of corporations has been the decay of business morality. To substantiate this, an invidious comparison is made of railway management during the last decade and half a century ago.

To pass thus on the moral standards of an age is a task which should appal any mere student of economics. One should, however, be on guard against the almost irresistible tendency to find a golden age on every turned page of history. On the face of it, Marshall's position seems more credible. Corporations, instead of being a corrupting influence, so far as business morality goes are in themselves evidence of improvement. Never before have small capitalists had faith enough in business integrity to trust their savings irrevocably to the care of directors. That it is done on so vast a scale now argues for progress rather than decadence.

The illustration which the author has selected to prove this degeneration is unfortunately chosen. In the earlier days, says the author, (p. 325) railways were built with stock subscriptions, were managed with honesty and prudence, and the stock was a safe investment. Recent developments are supposed to show a change radical in degree and harmful in character. It is true that earlier railway financing depended less on mortgage bonds and more on stock. The advantage which the author infers, namely, that the promoters risked only their own capital, does not follow. From the beginning it was customary to solicit loans or contributions (even the loans frequently becoming contributions), from the state or municipality which the road traversed. To obtain donations from public authorities by methods at times approximating blackmail is not necessarily an improvement over borrowing on bond and mortgage. At least public opinion as mirrored in law does not think so, for the granting of municipal aid to railways has commonly been prohibited by state constitutions since 1870, while borrowing is still legal. As to honesty and prudence of management the evidence is no more satisfactory. In 1855 (a year which lies near the author's ideal era of half a century ago) the same complaints were made which are heard today. Directors were said to possess "none of the qualifications of fitness, study, and experience," and were charged with "prostituting their trust to promote their own private interests."[1] The statement that in the early days of railroading stock was a safe investment is altogether too sweeping. In 1835, a date certainly in the early days, "Prices of railroad stocks were generally speculative as the roads were unfinished and their success simply theoretical. The Harlem road sold as high as 190, and then fell to 65, all in five or six weeks, owing to a corner which was made."[2] Poor states that for the

[1] *Report of the New York Railroad Commission*, 1855, pp. xix. and xliii.

[2] MARTIN, *Twenty-one Years in the Boston Stock Market*, Boston, 1857, p. 75.

first twenty years of railroad history (1828–1847) even the best located lines were run at a loss. Nor was it the stock alone which was insecure. The present reviewer happens to have in his possession a bond which is said to be one of the first block ever issued by an American railway. As this was defaulted soon after issue it appears that even bondholders suffered then as well as now.

In multiplying accusations against large corporations the author makes complaints which seem to be mutually contradictory. Thus he criticises the trust both because it means the centering of wealth in a few hands (p. 339) and also because the controlling interest does not really own the property, that belonging to the bondholders (p. 320). Can wealth be centered in the hands of a few when all they own is worthless stock (p. 135)? As this stock pays no dividends (p. 321) how can it increase the wealth of the holders as a class? It is true that it may be sold at a profit, but only to other speculators, for no one ever buys common stock as an investment (p. 231), and only those buy who can afford to lose (p. 326). Transactions thus limited to a group of professional speculators are of comparatively little import to the general public. The police may well protect the unwary against the solicitations of a confidence man, but they need not worry over the performances of a close circle of wealthy poker players.

Again, the author says that labor is ground by corporations which select managers solely for their ability to secure dividends (p. 320), yet the only stock which the directors hold seldom or never pays a dividend (p. 321), and no great effort is made to run the business on a paying basis, since the directors' interest is purely speculative (p. 323). The statement that trusts injure the industries of the country by managing them on other than business principles harmonizes poorly with the apprehension that small competitors will be crowded out because the trusts can afford to hire more competent managers and experts (p. 350). When the harm done labor is under discussion it is said that the trust can seldom make a saving in buying raw material (p. 328); when the subject is the injury done small dealers, the ability of the large organization to buy more cheaply threatens the existence of the independent shopkeeper (p. 306). Enormous gains with no dividends, wealth consisting of worthless stock, good managers and bad management, bilking the public by selling stock which no one will buy, economy and extravagance,—surely the trust as portrayed by the author is of a protean character.

A few other criticisms may be briefly made. It is hardly correct to say that a fall in interest injures labor rather than the capitalist (p. 330); history does not support the claim that the great inventions of last century were in marked contrast to those of today in that the former worked immediately to the benefit of the laborer (p. 328); it is true that the apprentice's privilege of sitting at his master's table is denied American workmen (p. 319), it should not be forgotten that the same development has made him exempt from his master's floggings; and, finally, there is no "section of the constitution prohibiting even Congress from making any law annulling the obligations of contracts" (p. 343).

The last chapter of the book discusses the policy to be pursued regarding trusts. Although so severe in his arraignment of trusts the author recognizes that large organizations are a natural development, and criticises any attempt to abolish them. Instead of destroying he would control; and he recommends legislation to prevent over capitalization, stock gambling, and discrimination, and to secure publicity of accounts. As a means of enforcing such control the government should appoint directors to represent the public in the board of directors of each large corporation.

HENRY RAND HATFIELD.

THE UNIVERSITY OF CHICAGO.

The Cost of Municipal Trading. A Paper Read before the Society of Arts, by DIXON HENRY DAVIES (with the discussion thereon and diagrams). Reprinted, with additions from the *Journal of the Society of Arts*. London: P. S. King & Son, 1899. 8vo. pp. 71, with 6 charts.

THIS paper and the discussion upon it have to do with the undertaking by the municipality of enterprises or industries commonly known as public utilities. Mr. Davies believes the growing tendency of British cities to municipalize certain industries is greatly to be deplored, and he thinks Parliament should be asked to exercise a restraining influence by refusing to grant to cities the permission necessary to the enlargement of their municipal activities.

Mr. Davies bases his objections to "municipal enterprise" upon "general economic principles of limitation of state functions, applicable

to municipal government as well as imperial." The growth of what he terms the proper municipal functions requires, he says, all the attention and resources of the authorities. The undertaking of industries by the municipality must tend to develop a bureaucracy, lacking both the stimulus and the restraint of private enterprise, the effect of which must be repressive. Mr. Davies considers four arguments in favor of municipalization: (1) cheap money; (2) community entitled to profit of communal service; (3) sordid motives of private enterprise, and (4) private monopolies objectionable — and finds them not convincing. As over against those arguments, he asserts that governments will not and ought not to take risks, they cannot invent and therefore municipal enterprise tends to stagnation.

It is when he comes to the consideration of the monopoly phase of these public service industries that Mr. Davies gives to his opponents their best opportunity for attack. He says:

> That such concerns are bound to become monopolies in the hands of the corporation [the municipality] may be admitted, for the whole power and authority of that body is used to defend them as such, and to prevent anyone else conducting a competing trade, which, but for the corporation, they would be entitled to do, but to say that they are monopolies when they are in private hands is an abuse of the term. They are only monopolies so long as by reason or their efficient service, or of the apathy of the community, the public do not choose to make the effort necessary to establish a rival undertaking.

If Mr. Davies' contention that public service industries may properly be considered competitive industries, is accepted, the conclusion urged by him that they should be left to private hands follows naturally enough. But the basal contention cannot be accepted. American cities have been proceeding on the theory put forth by Mr. Davies, and with very sorry results, for the most part. The fact is that the street car business, the telephone business, the gas business, the electric light business, and similar industries requiring for their prosecution franchises for the use of public highways, are, in the nature of things, bound to develop into monopolies. Not only that, but they should be monopolies, and it will be better for all concerned when they are treated as such. A concern enjoying monopoly privileges can furnish much better and cheaper service than several competing concerns. Progressive municipalities the world over are beginning to recognize that fact and to act accordingly, whether their policy be to operate such industries themselves or to entrust the management to private hands.

Granted that these industries should be monopolies, and considering that special franchises or licenses are necessary in order to enable private individuals to engage in the business at all, the question presented as between a public monopoly and a private monopoly under strict public control is simply one of results. No fundamental principles, either of economics or government, can rightly be appealed to as decisive in favor of one course as against the other. That course is best which experience and trial shall show to be productive of the most efficient service and the lowest rates to consumers, and which interferes least with the other activities of the government and the people. Naturally local and special conditions must be an important and probably the determining factor in each specific instance. Mr. Davies gives his case away, in so far as he attempts to defend his position upon grounds of fundamental principles of economics and government, by admitting the desirability of municipalization of the supply of water, "which, as a matter of common necessity, and one connected with vital questions of public health, may well be entrusted to the management of the civic officers, more especially as it does not involve any manufacturing risks, and cannot possibly be replaced by another article." If the special reasons advanced are sufficient justification for municipalization of water works, kindred special reasons may be advanced for the municipalization of lighting and transportation systems; then the conditions are favorable to that policy.

Mr. Davies is not fortunate when he draws on America for illustration. He says:

> It would be wrong to overlook the serious state of the municipal institutions of America, arising, as competent advisers tell us, from the unlimited enlargement of the functions of the government. The consequence is that public employment is excessively multiplied and the municipal debts have risen to colossal dimensions. The affairs of the cities are left to professional politicians, and are conducted in such a nauseous atmosphere of class corruption and party trickery, that the better class decline to have anything to do with them. A distrust of the servants and representatives of the people is everywhere manifest.

The authority cited in support of this statement is Lecky, *Democracy and Liberty*, Vol. I. pp. 80–86. As a matter of fact, Mr. Davies has misinterpreted his authority. Mr. Lecky, in the pages cited, is speaking of the evils of the spoils system as it exists in America, but he does not even hint at the extension of municipal function in the

direction assumed by Mr. Davies. The truth is that American cities have done comparatively little in the way of management of industries, but have usually left such matters to private corporations, and only too frequently with most scandalous results. Mr. John Burns, M. P., who took part in the discussion of Mr. Davies' paper, showed a better understanding of American conditions, when he said the maladministration of American cities was due in an important degree to the influence of private enterprise in search of special privileges for the management of these public service industries.

Mr. Davies presents charts showing the increase of rates and debt for the past twenty years. The debt increase for cities is striking, and much more than half is for what Mr. Davies terms trading purposes. The charts are deficient, however, in that they do not show what assets are possessed by the cities as an offset to this indebtedness. In other words, the charts fail to throw light on the real question at issue, which is, have the expenditures which this debt represents been profitable ones, and is the public warranted in making more of the same kind?

The paper of Mr. Davies, together with the discussion thereof, is interesting but not highly profitable, unless, as was suggested, it should lead to a parliamentary inquiry covering the entire subject. The need for literature upon the subject of municipalization is not for statements of *a priori* arguments for one side or the other, but for light upon the practical workings and possibilities of public as opposed to private management of these industries under monopoly conditions. The field is one calling for careful research and examination of conditions as they exists, and the presentation of the results of investigation in such manner as to warrant the drawing of inferences applicable to various sets of conditions. GEORGE CUSHING SIKES.

Economic Aspects of the Liquor Problem. By JOHN KOREN. An investigation made for the Committee of Fifty under the direction of HENRY W. FARNAM, secretary of the Economic Sub-committee. Boston: Houghton, Mifflin & Co., 1899. 12mo. pp. x + 240 + 87.

THIS is the second volume in the series of official publications of the Committee of Fifty, the first having appeared in 1897, bearing the title, *The Liquor Problem in its Legislative Aspects;* while other volumes on other aspects of the problem are promised. The object

of the Committee of Fifty in making these investigations is to secure and to discuss impartially a body of facts relating to the liquor problem "which will serve as a basis for intelligent public and private action" (p. 7). In doing this work the committee has taken a most important step toward a correct understanding of what the problem really is. Much that has been said in years past on the subject of intemperance in this country has been idle, and much of the energy spent has been fruitless, because the situation was not understood. The first essential step in any real reform is made by ascertaining what the facts and conditions are which must be dealt with.

The present volume, while it deals with the economic aspects of the liquor problem, does not attempt to discuss every phase of the problem which might be classed under that head. The *Twelfth Annual Report of the Federal Department of Labor* (1897), which also bears the title, *Economic Aspects of the Liquor Problem*, discusses fully the important subjects of the production and consumption of liquor, together with that of the revenues derived from the traffic. The Economic Sub-committee of the Committee of Fifty, planning with the Department of Labor so that the two investigations might supplement each other, discusses in the present volume the *effect* of the consumption of liquor as related to poverty, pauperism, and crime.

A discussion of these phases of the problem constitutes the chief chapters of the book and represents a great amount of careful work and wide research, the sources of information embracing the records of thirty-three charity organization societies, eleven children's aid societies, sixty almshouses, and seventeen prisons and reformatories scattered throughout twelve states. In respect to poverty, it was found that about 25 per cent. of the cases could be traced directly or indirectly to the use of liquor. Of the cases of poverty found in the almshouses the use of liquor was found to be responsible for some 37 per cent.; while in the cases of the destitution of children not less than 45 per cent. was found to be due to the liquor habit, either of parents, guardians, or others (pp. 21, 22). These percentages are considerably lower than has heretofore been generally supposed; and what is true in respect to poverty and pauperism is also true of the relation of liquor to crime. While 50 per cent. of the crimes committed by the 13,402 convicts whose cases were examined were due to intemperance, intemperance was a first cause in only 31 per cent. of the cases, and the sole cause in only 16 per cent. of the cases studied (p. 30).

Following the general discussion as indicated above is a chapter on the effects of liquor among the Negroes, another on the effects among the North American Indians, and a closing chapter on the social aspects of the saloon. The last chapter might at first seem out of place in a volume devoted to the economic aspects of the subject; and yet there is a very close connection between the two, the object in the present case being to describe the saloon as a distributing agency between the producer and the consumer of alcoholic beverages, and to point out some of the attractions which the saloon-keeper holds out to his customers. The fact is recognized that the saloon supplies, besides drinks, many social wants which are not at present provided for in any other way; but in praising these negative virtues the fact is almost lost sight of for the moment that these features are only attractions; that the paramount object of the saloon-keeper is to sell intoxicating beverages, and that his efforts are not in the direction of a moderate use of liquors, but in the direction of an excessive use of them, in order that he may increase his sales and thereby his profits.

The book is of great value. The spirit which pervades it is scientific and fair, and where opinion is expressed, it is always conservative. It is, in the opinion of the present writer, by far the best contribution to a scientific understanding of the subjects which it discusses that has yet been published, and is a volume which should be carefully read by everyone desiring to study intelligently the liquor problem.

J. E. GEORGE.

ROXBURY, MASS.

Economics and Industrial History for Secondary Schools. By HENRY W. THURSTON. Chicago: Scott, Foresman & Co., 1899. 12mo. pp. 300.

THE adaptation of any study for school use, especially for elementary or seconday schools, must be a matter of slow growth. For a quarter of a century we have been trying to give young people the elements of economics, first in the colleges, then in the secondary schools and now even in the elementary schools. The results have been far from satisfactory, and one reason for it has been that the subject-matter has not been cast in the proper form for the young beginner; in other words, suitable text-books have not existed. The books were written either by school teachers who knew little economics or by university economists

who knew little of the pedagogical requirements in a book designed for school use. Now that there are found in some of our secondary schools, teachers who have had thorough training in our best universities, books of a different order are appearing. The subject of this sketch is the third book by a properly qualified writer that has appeared within three years. In three years more the books of ten years ago will be doing little except gather dust and occupy shelf-room.

Mr. Thurston both knows his economics well and has been eminently successful as a high-school teacher; during the present year he has been head of the department of social and economic science in the Chicago Normal School. This book was not written to order, but has gradually developed during five years of teaching combined with university study.

The book is in three parts: (I) A study of industrial life by observation, (II) the industrial history of England and the United States, (III) economic theory. An appendix contains some statistical tables and a list of the authorities cited. The introduction is written by Professor Albion W. Small, of the University of Chicago. Accompanying the book is a teacher's manual of twenty-five pages containing suggestions how the book should be used.

Part I contains the most novel features. The author calls it a "laboratory study of existing economic life." The pupils are required to develop classifications of occupations, of forms of business organization, of the agents in production, of goods for personal consumption, etc., out of their own experience or from observation of the business life about them, with some use of books and those chiefly original materials. This part is divided into nineteen lessons; for each piece of work minute directions are given in the text and in the manual. Every feature of this work, the author says, has "been tested in actual class room experience." This part is a valuable contribution to the pedagogy of economics. While some of the exercises would be impracticable in most places, the plan could still be followed lesson by lesson in any high school; only intelligent direction on the part of the teacher and hearty co-operation on the part of the pupils are necessary to success. An infinite improvement this would be over the dreary memorizing of a text that so often passes for the study of economics. Even teachers who do not use the book as a text will find many of these exercises useful. It is safe to predict that the thirty pages

contained in Part I will have a wide influence for the better on economics as a school study.

Part II includes about half of the volume. It comprises four chapters, one for each of the four stages into which it has become customary to divide the development of manufactures — family, gild, domestic, and factory. The question at once arises whether the development of agriculture, transportation, and the other sides of industrial activity, are wisely crowded into these four divisions. To put the industrial history of America in colonial times all into the chapter on the domestic system is singularly inapt: the author himself states that "almost the whole of such industry (manufacturing) was of the early type called in chapter I the Home System of Industry.[1] On the same page it is stated that the "Gild System of industry had no general development in America," because "artisans in a particular industry were too few in any locality to give much opportunity for the elaborate gild regulations which had formerly existed in England." It is better to follow Professor Ashley and to understand by the "Gild System" something more than the supervision of industry by those curious mediæval societies, to consider the little shop, with its group of handworkers and not the gilds as the distinguishing characteristic of the system. Terms aside, however, Part II, is well executed. It is by far the fullest and best account of economic history for the use of secondary students that is now in print. The publishers would do well to issue in it a volume by itself, as it will be wanted extensively by teachers will not care to use Parts I and III.

Part III is an attempt to present the principles of economics in eighty-seven pages. This small compass is reached, however, not by condensation in the usual manner of the text-book, but by exclusion. Credit and banking scarcely appear at all; money is dismissed in six pages of comments and questions. Value and marginal utility are carefully elaborated in the opening chapter of twenty-five pages; of the five pages given to rent, a little over four treat of the unearned increment with the history of a quarter acre of land in the heart of Chicago as an illustration; six pages are given to such practical phases of the labor question as trade unions and the eight-hour day; in the four-page discussion of the share of product going to the government, a place is found for Professor Seligman's classification stated in his own words.

[1] P. 122.

Deductive reasoning which occupies so prominent a place in most text-books on economics is in this book reduced to a minimum; even Part III, excepting the chapter on value, is either descriptive or else a running comment on practical economic problems; those who have been trained in economic theory may find little that they are familiar with either of form or substance. It is a radical departure from all its predecessors.

It is not possible to pronounce definitely on the merits of the work. Experience alone can tell whether the infusion into economics of so much sociology and economic history is wise. Should observation of industrial life and the study of industrial history be set apart by themselves, or should they be taken in connection with the theory? Should scientific principles receive scant attention, that more space may be given to practical problems? Are money and banking not suitable subjects for study in an elementary course? These questions can be more profitably discussed after Mr. Thurston's book has been used a year or two. That it will considerably modify the present methods of teaching economics seems probable. That few teachers will care to follow it closely also seems probable. This latter fact Mr. Thurston has foreseen and provided for to some extent by furnishing an abundance of references to aid a teacher in making desired variations.

F. R. Clow.

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The Elements of Public Finance, Including the Monetary System of the United States. By Winthrop Moore Daniels, M.A., Professor of Political Economy in Princeton University. New York: Henry Holt & Co., 1899. 12mo. pp. 383.

There is room for difference of opinion as to whether public finance can be profitably pursued as an ordinary college study. Hitherto most of the instruction offered in this field by American institutions has been of the university type, and such treatises as have been published have had a rather mature class of students in view. But the undoubted growth of popular interest in questions of financial reform in the last decade has led many of the colleges to include brief courses in the theory and history of finance in the curriculum, and it is the needs of these that Professor Daniels has had in mind in planning the

scope of his manual. The volume is evidently the outgrowth of the author's experience in the class room, and every page gives evidence of the clear insight and vigorous presentation that characterize the text-books of successful teachers. It is a stimulating commentary on current financial theories and an illuminating criticism of current financial methods in the United States. As such it can hardly fail to awaken a lively interest in its subject, both among students and lay readers. It is, moreover, full of good sense admirably expressed — rare virtues, both of them, in the academic literature of economics.

An interesting program for the reform of state and local taxation is sketched by Mr. Daniels which is in substantial agreement with the best recent thought on the subject. The chief evils of our general property tax are two: the first is the unfairness wrought by the taxation of realty for state purposes; the second is the injustice resulting from the futile attempts of local governments to tax personal estate (p. 124). The machinery of state boards of equalization is no cure for the first evil and the machinery of "listing," oaths, or tax inquisitor laws cannot reach the second evil. What, then, is the remedy? It is, in the judgment of the author, the abolition of the state tax on real estate and the local taxes on personal estate — in a phrase, the separation of state from local taxation. He would make realty the chief basis of local finance, and the taxes on corporations and inheritances the chief elements of the state revenues. Tangible personalty, such as farm stock or stock in trade, and mortgages, he would exempt, on the general assumption that processes of shifting will equalize the advantages attaching to different species of property (p. 128). This view seems too optimistic, in view of the great uncertainties and the friction that inevitably attend the process of shifting. This apart, however, the plan offered is commendable. A. C. M.

Landmarks in English Industrial History. By GEORGE TOWNSEND WARNER, M.A., sometime Fellow of Jesus College, Cambridge. New York: The Macmillan Company, 1899. 12mo. pp. 368.

THIS work is a striking effort to bring together in moderate compass the results of the various researches in the field of English economic history in such a way as to exhibit the salient features of England's industrial and commercial progress in a significant and

orderly sequence. Instead of attempting to force the material into a strictly chronological mold on the one hand, or, on the other, of trying to organize it on a few simple lines, Mr. Warner has taken a middle course, and has chosen what appears to him the chief landmark of each age, and grouped round it the events which led up to it, and the consequences which came from it. Thus we get a series of remarkable chapters describing the chief streams of policy and tendency, and the action of the causes that have made up the economic history of England. In some of these chapters, as, *e. g.*, The Black Death, Elizabeth's Legislation, or The Agrarian Revolution, the treatment is masterly and the most suggestive we know of. The effect of the whole work is greatly enhanced by an attractively lucid style. A cordial reception may safely be predicted for this volume by all teachers of economic history. A. C. M.

The Wheat Problem, Revised, with an answer to various Critics. By Sir William Crookes, F. R. S. With chapters on the future wheat supply of the United States by C. Wood Davis and John Hyde. New York: G. P. Putnam's Sons, 1900. 12mo. pp. xiii + 272.

A secondary purpose of Sir William Crookes's essay on "The World's Supply of Wheat" apparently is to call attention to his experiments in the fixation of nitrogen. These experiments may well have a grave significance for the future food supply, or at any rate the question of the artificial fixation of nitrogen may come to be a vital question, although there are probably few economists who see the problem of artificial fixation as a sphynx's riddle impending in the immediate future.

The author's argument converges to the conclusion that a general scarcity of food is, at the most, no more than a generation ahead. In this he is ably seconded by Mr. Davis's hearty co-operation and has also the somewhat equivocal support of Mr. Hyde's discussion of the wheat problem. Of Mr. Davis it is of course expected that he should unreservedly throw what weight his word has on the side of Sir William's contention. But Mr. Hyde, as becomes a cautious statistician, is noncommittal in any matter of forecast, except where he is on the safe ground of available acreage. Mr. Hyde speaks directly to the point which he has set before him, viz., the wheat supply; and he does not commit

himself to the implication that "the wheat supply" is or comes near being synonymous with "the food supply." He deals with the question as a statistical problem of acreage, and has very little to say on the more important question of yield; for future changes of yield, so far as concerns this country, cannot be discussed with any definite outcome on the basis of present statistics. He is, however, content to leave the question of probable future yields with a simple indication of what has been the course of average yields for twenty years back, neglecting to point out that the situation of the grain market during this period has been such as to discourage all efforts to increase the yields of any of the common grains, and so leaving the misleading suggestion that the course of future yields is to be directly inferred from the yields in the immediate past. But while Mr. Hyde's most telling contribution to the argument for a scarcity is this, probably unintended, misleading implication, Sir William faces the question of yields and disposes of it in one of the most extraordinary passages that has yet been met with in all the curious literature extant on the wheat question. In a reply to criticisms offered by Sir John Lawes and Sir Henry Gilbert he argues (pp. 104–107) that the low yields of America, as compared with those of England, are due to conditions of climate and soil, not to the American farmer's less close economy in the use of land. "American methods are quite as well adapted to the soils and climate as are those of England to the soils and climate of Great Britain." This passage the context compels us to take seriously. The consummate ignorance of the aims and methods of American farming reflected in this statement is assuredly surprising enough in a scientist who has so evidently taken pains to inform himself on other features of the subject. And it is at the same time unfortunate in that it may raise a presumption that other, more substantial portions of the argument proceed on equally fanciful and headlong generalizations. In the face of his incredible dealings with these economic data, it needs all the prestige of Sir William's great name to sustain our faith in what he has to say when he is speaking within the lines of his own science.

Correlated with this assumption, that the yield per acre is necessarily stable, is an equally surprising assumption to the effect that the unit consumption of wheat must go on increasing and so hasten the approach of scarcity. Abundance during the past fifteen years has resulted in an increase of unit consumption, and this increase, it is argued, will go on in the face of a slackening supply so as to cause a

scarcity in the future. That is to say, because we have had abundance and consequent low prices of wheat, resulting in a high unit consumption and a low yield, therefore we must expect that in the future we shall have a high unit consumption and a low yield, resulting in scarcity and high prices. Certain passages in the volume might even be construed to say that we shall presently suffer privation because of the excessive prosperity and efficiency of our industry in the future.

So far as the essay is an argument for impending scarcity it proceeds on the assumption that "other circumstances remain the same," particularly the adverse circumstances. But there appears to be no reason for believing that other things will remain the same in the immediate future, any more consistently than they have done in the past. It may therefore fairly be doubted whether Sir William's draft on the future's bank of misery will be honored, since it is drawn with this proviso. T. V.

Die Entstehung des socialen Problems. Von ARNOLD FISCHER. Rostock i. M.: C. J. E. Volckmann, 1896–1898. 8vo. pp. xvi + 781.

THE social problem with which the author is occupied is of course the problem which modern socialism offers to solve. A solution is sought in a "science of civilization," differing from earlier attempts at such a science, particularly in the degree of profundity and exhaustiveness with which the causes of cultural growth and the controlling principles of development are examined and formulated. If once an adequate theory of culture has been established, the author feels, the rest follows as a matter of course, though not necessarily by an easy and unlaborious inference, from the main drift of this theory. The social problem which confronts the present generation is a necessary phenomenon of the present phase of culture; it is a fruit which in the natural course ripens at the present stage of cultural maturity, and at no other stage. If we can find wherein consists the essential character of the growth in cultural maturity, we shall, therefore, have a key to the successive emergence of the problems that arise in the life history of society as well as to their significance for the growth of civilization and to their practical solution.

The degree of maturity attained by human culture at any given phase is a question of the degree of exhaustion of the vitality of the

culture in question. The ultimate ground of the problem characteristic of any given cultural phase is, therefore, the intensity of vital force which expresses itself in this cultural phase. "Zeitprobleme sind daher Gradmesser der Lebenskraft und damit der Höhe des Lebensalters jener Cultur, aus der sie emporstiegen" (p. 3). At the same time. "Ein Zeitproblem ist das Bewusstsein eines Uebels des Gemeinwesens" (p. 5). We have therefore to seek a formulation of the course of civilization "as the resultant of a clearly determined law." And since mankind is but a part of the organic world, human civilization is but the resultant of the same forces which determine the development of species in plant and animal life. Now, the sweeping characteristic of the life process of organisms is a continuous decline in the intensity of the forces engaged. Observed phases of development are therefore expressions of stages in the decline of intensity of the life process. This law holds throughout organic life, and as the course of organic development and of culture proceeds we have, as the result of advancing decrepitude, an advance from a blind but fierce assimilative growth, through instinct, feeling, reflection, to rationality and to pure reason. The latter phase of development, the phase characteristic of senile decay, is now upon us, and our social problem is an expression of the evils peculiar to the social organism at this stage. The working class of the present day is the class of pure reason.

With this clue the author cheerfully constructs his comprehensive theory of cultural growth, and apart from this grotesque resort to analogies and metaphysical entities there appears to be but little of a theoretical kind that is new or characteristic in the volume. The theoretical contribution here offered may be taken as an extreme case of that recourse to mystical interpretation, which any reader of the later German speculations in social and economic theory must be prepared to face. But for all his mysticism, the author shows a wide acquaintance with the data of his subject, and no mean capacity for turning them to account. T. V.

Pamphlets socialistes: Le droit à la paresse; La religion du capital; L'appétit vendu; Pie IX au paradis. Par PAUL LAFARGUE. Paris: V. Giard & E. Brière, 1900. 12mo. pp. 164.

THESE discourses, reprinted here in collected form from widely separate dates, are held in the light and easy vein characteristic of M.

Lafargue when he aims to be entertaining. The first two are well-known pieces, of a satirical purpose; the two latter are of the same class, though newer and less well known. The whole is excellent in its kind, with an excellence characteristic of the propagandist literature of which it is an exceptionally effective sample. As commonly happens in the case of the socialistic satire from the continent of Europe, the jests are too broad, of too maudlin a complexion to appeal with full effect to English, and particularly to American readers. This is particularly true of the later ones of these pamphlets of M. Lafargue's. The satire is overstrained to such a degree as to defeat its own purpose.

T. V.